

# MOTOR AGE

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JULIAN CHASE, Directing Editor  
W. K. TOBOLDT, Editor

FRANK P. TIGHE, Managing Editor ROBERT HANKINSON, Technical Editor  
GEOFFREY GRIER, Art Editor  
JOS. GESCHELIN, Detroit Technical Editor H. E. GROSENTH, Detroit Editor  
MARCUS AINSWORTH, Specifications Editor

## In This Issue

Eyston at Bonneville. <i>By Bill Toboldt</i> . . . . .	17
At the Texas Centennial. <i>By Frank Tighe</i> . . . . .	18
When You Talk on the Telephone— . . . . .	20
Let 'Em Down Easy. <i>By Robert Hankinson</i> . . . . .	22
Repair Shops at the Ends of the Earth . . . . .	24
For Performance—Recondition Valves and Seats . . . . .	25
"Before" and "After" Bigger Profits . . . . .	26
What Causes Scuffing. <i>By Don Blanchard</i> . . . . .	28
It Takes Guts to be Free. <i>By Julian Chase</i> . . . . .	29
Maintenance Man's Map of the U. S. A. . . . .	30
Adjusting the Ross "Twin Lever" Steering Gear . . . . .	31
Service Hints from the Factories . . . . .	32
They Learned About Maintenance from Her . . . . .	33
Profitable Ideas. <i>By Frank Tighe</i> . . . . .	34
Readers' Clearing House . . . . .	36
News and New Products . . . . .	40
Mechanical Specifications . . . . .	62
Tune-Up Specifications . . . . .	63
Advertisers' Index . . . . .	86-87

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MOTOR AGE, August, 1936

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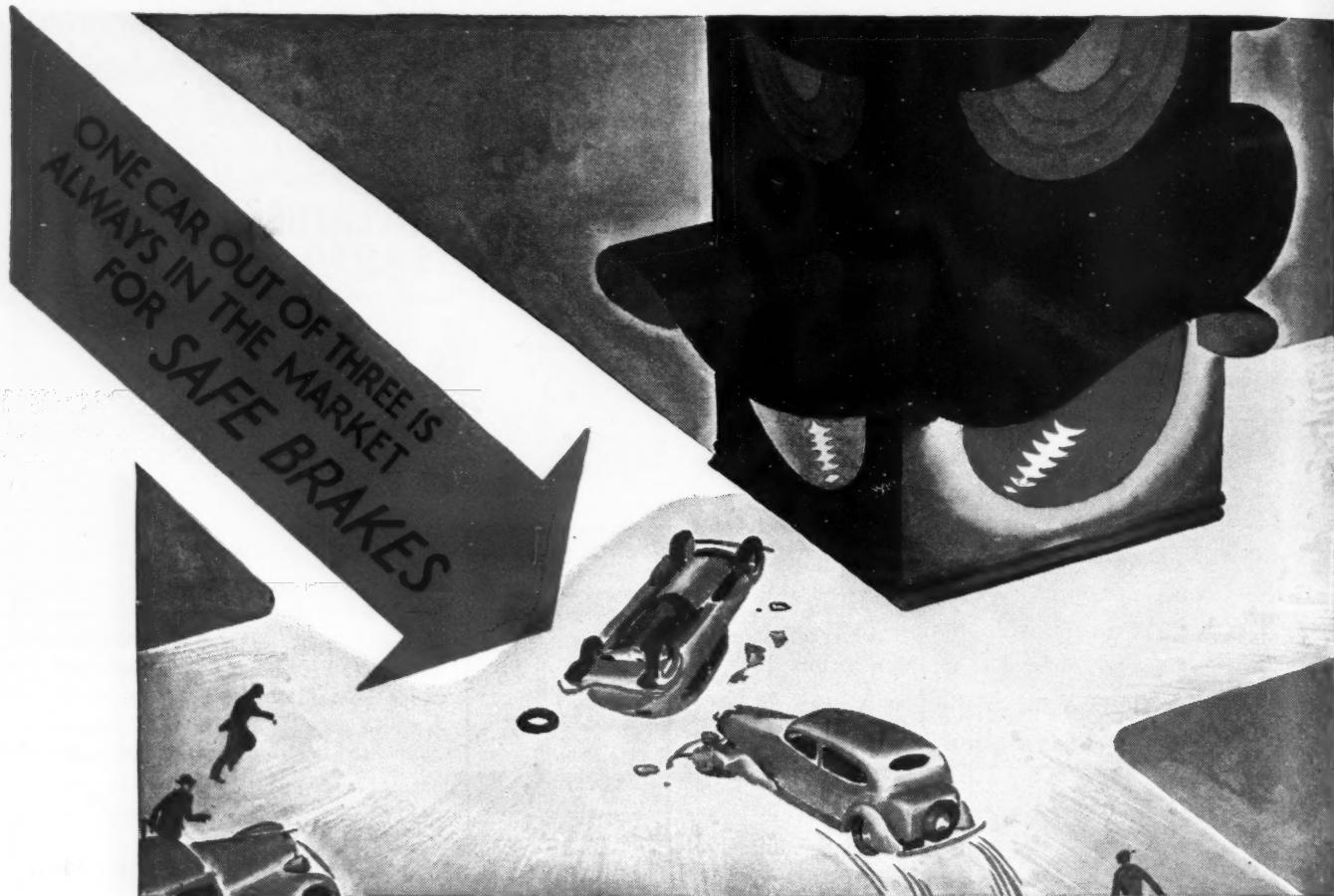
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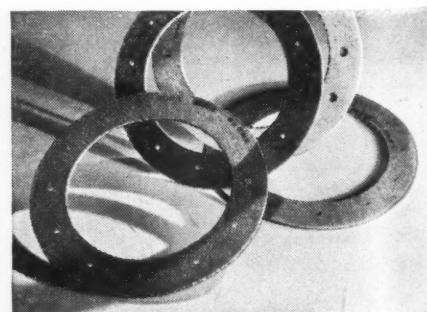
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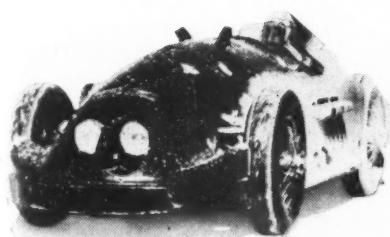
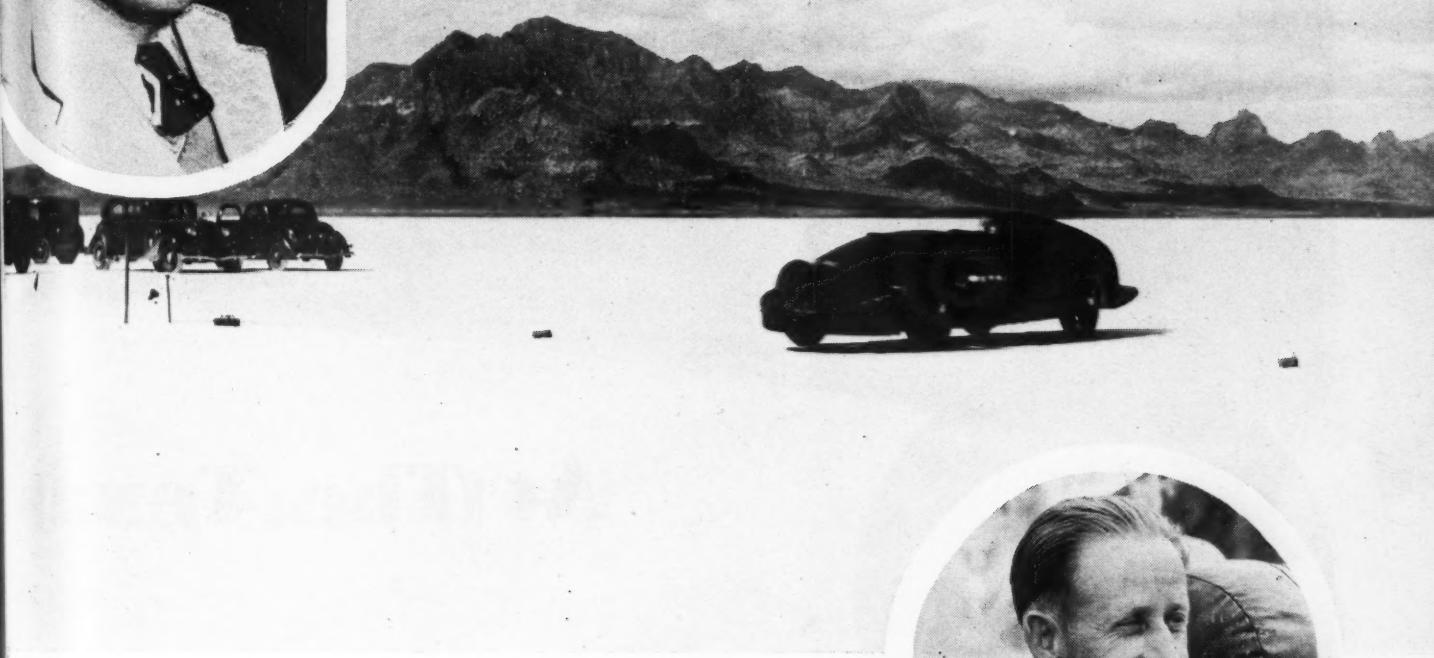
**WINMOR LININGS**



**SEALED SETS**



**CLUTCH FACINGS**



**R**ECORDS are made to be broken" was the congratulatory message wired by Ab Jenkins, last summer to Captain G. E. T. Eyston, who had just eclipsed the 24-hour record of 135.47 m.p.h. set by Jenkins only a month previously in a Duesenberg.

Now, a year later, Eyston has again turned in a new set of records, ranging from 200 kilometers at 162.42 m.p.h. to 136.349 m.p.h. for 48 hours. Like Jenkins, Captain Eyston used the salt flats in Utah for his record breaking runs. Complete details of the new records are given on page 41. One hundred and six new records have been set by Captain Eyston in his specially built racer "The Speed of the Wind," which is powered with a 12-cylinder Rolls Royce engine. Now, Ab Jenkins is ready to go—once more—after Captain Eyston's newly established marks!

Truly, records are made to be broken.

*Bill Tolson*



## At The Texas

### Top of Page:

General Motors Corp.; Gulf Refining Co. Leading exhibitors at the Texas Centennial Exposition

### Down the Column:

One of six focal points of interest in the General Motors Hall.

In a jewel-box setting, Chrysler displays its automotive products.

"Chief Pontiac," a trade mark that comes to life at the Centennial.

### The Automotive Exhibitors: Who They Are And What They Are Doing

THE throngs driving to the Texas Centennial Exposition this year once again behold the automotive industry as Public Exhibitor No. 1.

To commemorate the Lone Star State's progress since becoming a free and independent State 100 years ago, big names in the industry are welcoming thousands of people daily at Texas.

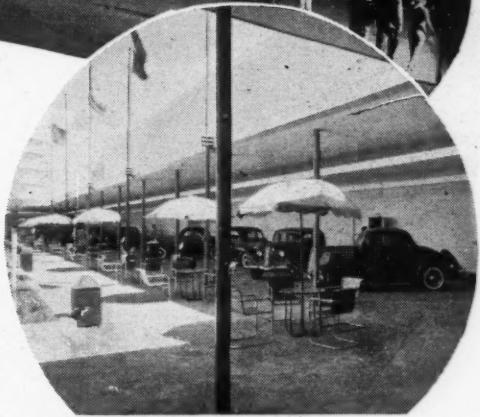
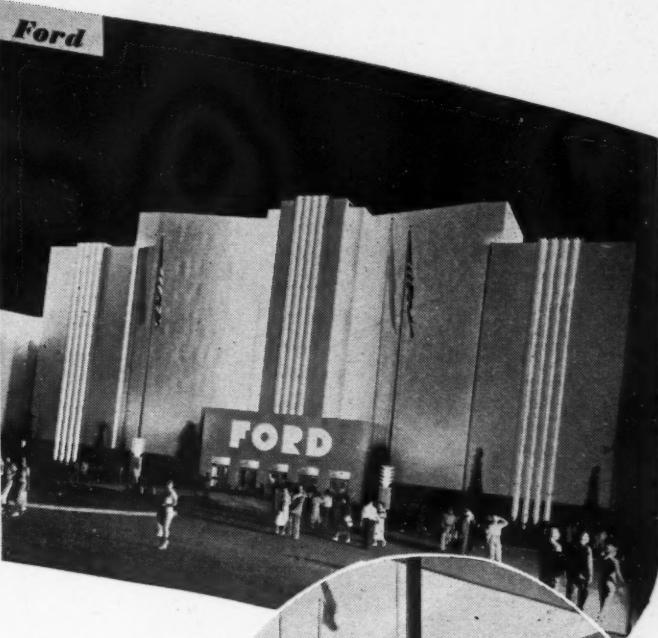
General Motors, Ford and Chrysler, with individual exhibits, have taken over 100,000 sq. ft. of display floor space at an estimated cost of more than \$2,000,000. Then there are the major oil companies, such as Gulf, Texaco and others. Among other exhibits are the International Truck and Bus exhibit, and the Nash-Lafayette Safety Driving exhibit.

In the main hall of the General Motors Auditorium is a complete display of General Motors cars representing Chevrolet, Pontiac, Oldsmobile, Buick, LaSalle and Cadillac.

**Chrysler**



**Ford**



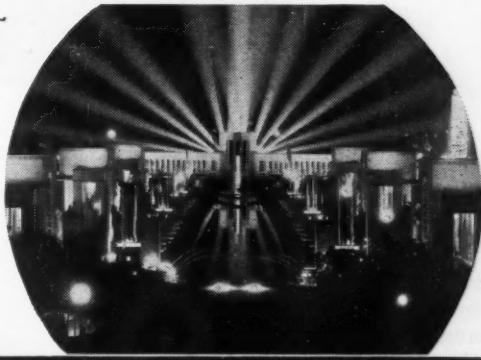
**Top of Page:**

Chrysler Corp.: Ford Motor Co.  
Leading exhibitors at the Texas  
Centennial Exposition.

**Down the Column:**

A colorful display of Ford,  
Lincoln and Lincoln-Zephyr cars  
at the Ford exhibit.

The Esplanade of State, at night.



The AC Spark Plug display at the  
Centennial shows the company's  
various products.



## as Centennial—

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**By Frank P. Tighe**

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Eighteen hundred seats in the balcony of the auditorium together with innumerable lounges and easy chairs on the main floor provide adequate seating facilities for the crowds. A Delco-Frigidaire Air Conditioning plant has been installed for the further comfort of visitors.

A mural, 8½ ft. high, depicting the latest transportation modes is the centerpiece of the main exhibition wall. Walls are in brown and in three tones of blue.

Among the displays is one depicting the safety features of General Motors' products. Another, a display of General Motors Research Laboratory's demonstrations which is an amazing display of scientific machines developed for the study and improvement of General Motors' products. Visitors can "see their own voice"; see sound carried on a light beam; bend a steel railroad rail by the weight of their

(Continued on page 65)



## When You Talk On Do You Snap At Customers?

**Like Any Other Piece Of Shop  
Will Pay Dividends When It's**

WHEN you answer the telephone identify yourself, such as: "This is the Universal Automotive Repair Company" or "Mr. Newton speaking." This is business-like, saves time, and encourages the other party to respond in the same manner.

Too much emphasis cannot be placed on the *voice*—its tone—does it ring sincere? Welcoming? Interesting? Or is it brusque, disinterested or routine? Consider the radio announcer. He sells the service of national advertisers. They do not permit sour-note gentlemen to announce their sales messages. What would you think of a radio announcement grunted out by a man who talked out of the corner of his mouth, ran all his words together, and who appeared annoyed to even have to talk over the telephone? The same thing applies to

you in your business conversations over the telephone.

One man replied to this advice and said:

"Now that's all very fine, but I have a mechanic named Jake—his voice has no smile in it; he may talk like he has a mouth full of carpet tacks, but when it comes to shooting trouble on automobiles he's no trouble to me!"

That's to be admitted, but keep those men to their special jobs,

if they are so good, and if they *can't be trained* to properly handle the telephone, *confine the use of your telephone to those who can—and almost anyone can.*

You will build your reputation if you will instruct your employees *not to use such words as "alrighty" or "sure" or "yessum" or "you bet" over the telephone, but to answer, "Yes, Miss Brainard" or "No, Mr. Colt."*

Talk in completed sentences, re-

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## The Telephone— Or Shake Hands With Them?

### Equipment The Telephone Used Right. Here's How.

remembering to drop your voice at the point of a period. This helps to break up your talk, makes it more easily understood and avoids making the other person hang on to a monotonous telephone conversation.

Issue a memorandum to all employees, something like the following:

"From now on we will pay very close attention to our business telephone conversations.

MOTOR AGE, August, 1936

"Each one of us is a salesman. While we cannot expect to be as perfect as professional radio announcers, we can learn a great deal from their methods, and handle our *telephone calls* with the best of attention and courtesy.

"Don't answer our telephone calls in jerky sentences, or with grunts, or monosyllables, or with a cigarette or cigar in your mouth, but reply in a courteous manner, just as if you were talking with

our biggest customer in person. Go out of your way to make each call, or each response to a call, complete, courteous and effective.

"If someone calls for a person who is not present, reply so to the caller, and then volunteer: 'Can I take care of the matter for you, Mr. Williams?' Or—'Can I have Mr. So-and-so call you, Mr. Tomkins?' With such a response the listener will realize that his invisible personality is not obscured by the telephone.

"It is your job to keep your voice pleasant and cheerful, even though you are feeling out of sorts. Our telephone response is the sales' voice of our firm, and we want to form pleasant telephone pictures to our customers, their friends, and the public in general.

"If you are calling a customer in  
(Continued on page 80)

**A** shock absorber service, such as appeared in the July issue of MOTOR AGE, would not be complete without a discussion of servicing procedure covering other popular makes of units. While the same general instructions for trouble shooting hold true, there are a few points of difference in the servicing of other units that should be understood by the mechanic who contemplates entering this profitable field of service.

#### **Servicing the Monroe Single-Action Type**

This type of shock absorber is provided with an external adjustment to change the riding qualities of the car, and can be adjusted by turning the tapered needle valve either in or out as may be required. While this adjustment is usually sufficient to bring about the desired action of the unit, cases may sometimes be encountered in which it is difficult to stiffen the action as much as the owner wishes. Such cases can be corrected by installing thicker disks in the relief valve. Care should be exercised, however, to be sure that disks of the same thickness are placed in each shock absorber.

Should it become necessary to disassemble the unit, place it in a vise, clamping the studs. Pull the arm down slightly to permit removal of the cover screws, cover and gasket. Let the arm back slowly, and remove the piston, valve and spring. Wash out the unit and all parts with gasoline, and blow them dry with air. Then remove the cam set screw and the cam, gently tap the arm and pull it out of the shock absorber body. Pry out the arm packing cap with a screw driver, and remove the old gasket. The adjusting screw can be removed by simply unscrewing the needle valve packing nut.

When assembling, be sure to use new arm packing caps and new gaskets throughout. Install the cap and the gasket on the arm, and start the arm through the shock absorber body. Hold the cam in its proper position with one hand, and with the other push the arm through it with the tapered hole in

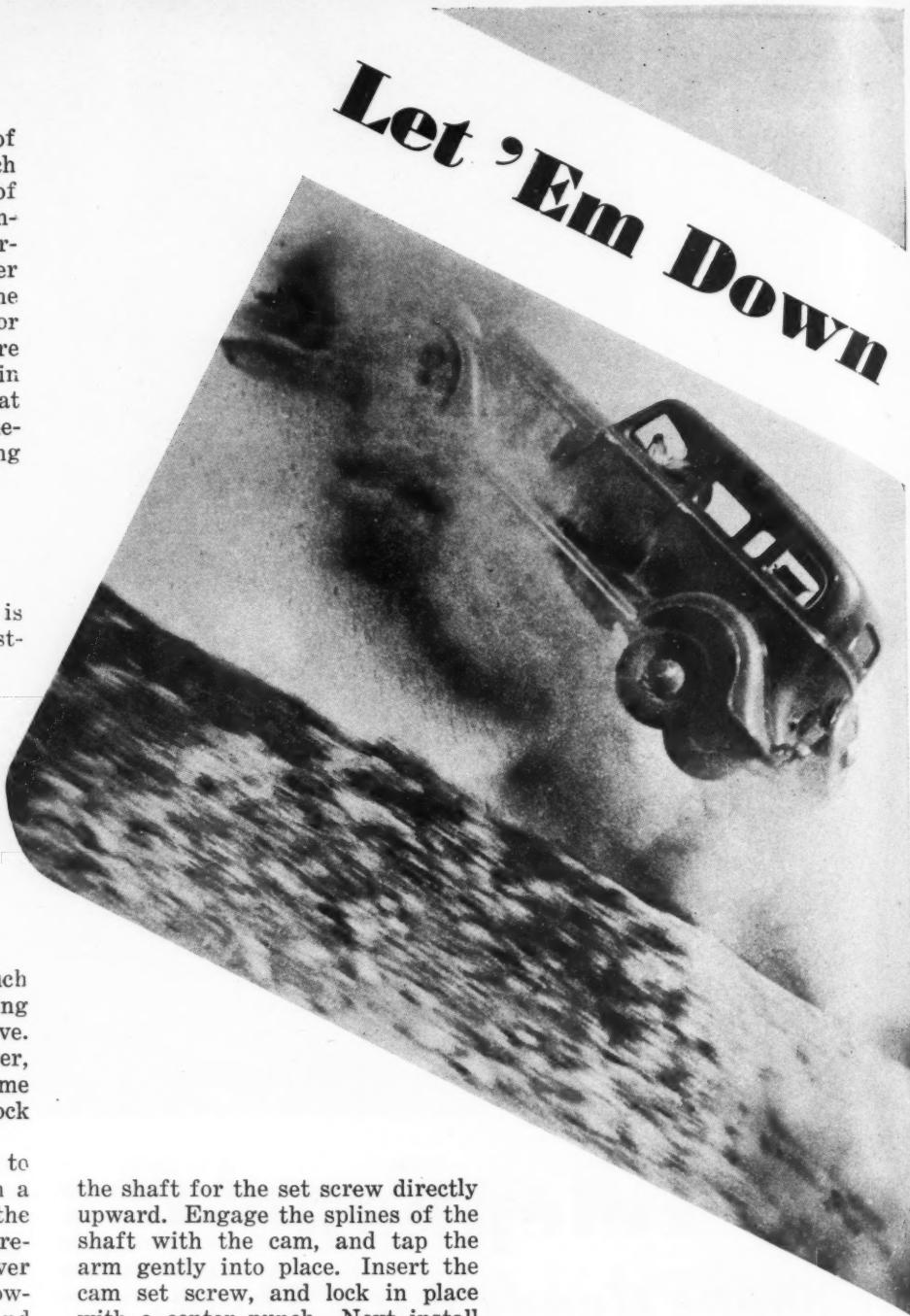
the shaft for the set screw directly upward. Engage the splines of the shaft with the cam, and tap the arm gently into place. Insert the cam set screw, and lock in place with a center punch. Next install the piston, spring and relief valve, being sure that the metal disk that floats inside the valve is seating properly, and that it is not cracked. A cracked disk will result in loss of pressure, and the shock absorber will be practically inoperative. Install the cover, using a new gasket, and fill the unit with new oil, working the arm up and down until all air is expelled.

#### **Servicing the Monroe Two-Way Shock Absorber**

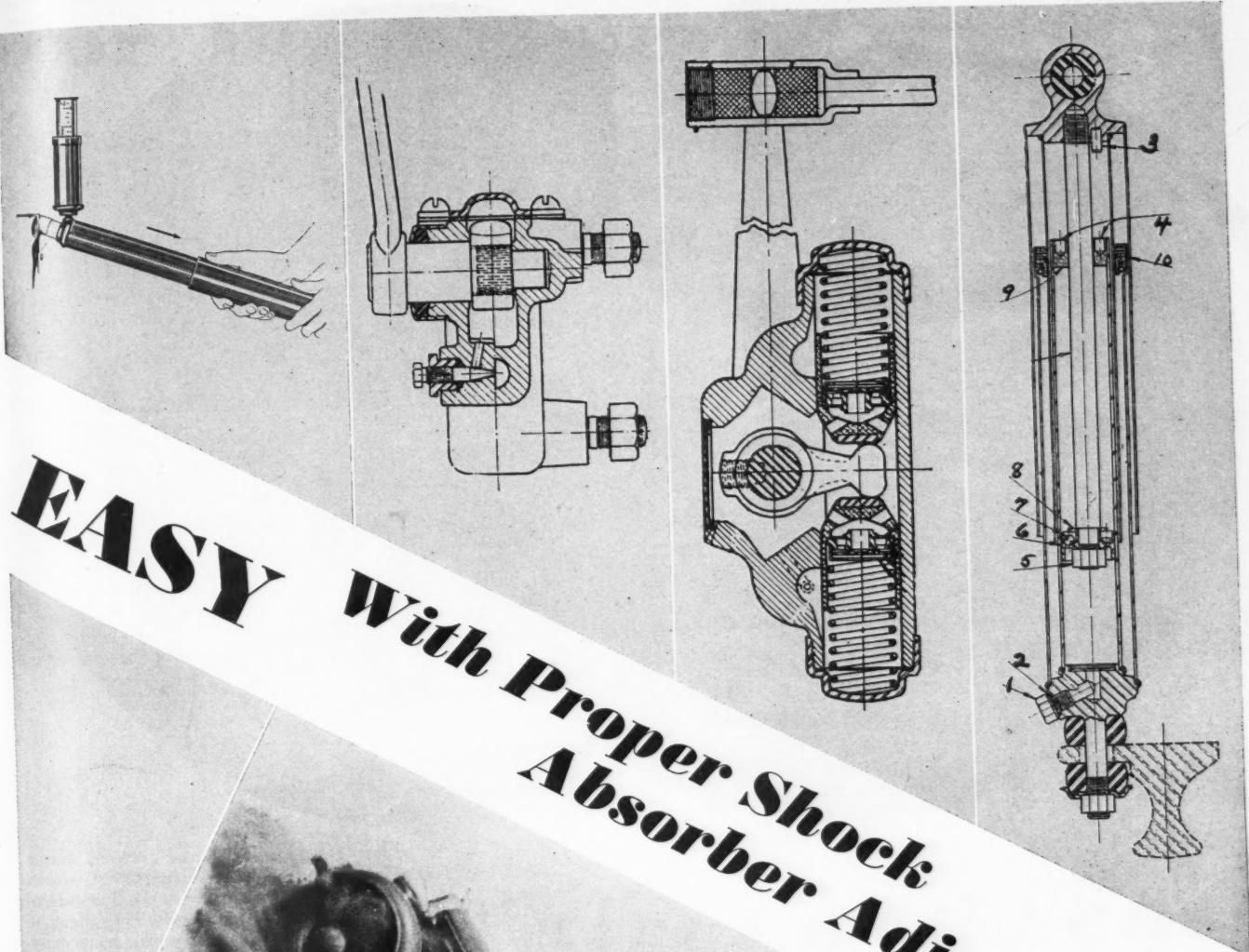
Oil leaks at the adjusting screw can usually be eliminated by first turning the needle valve in to its seat to determine the present setting, and then backing it out one

turn. Tighten the packing nut and readjust the needle valve. The end caps can be tightened with a large socket wrench to eliminate oil leaks at these points. When leaks exist around the shock absorber arm it is necessary to remove the unit and disassemble it to remove the arm and install new packing. The cover is removed by driving a chisel through it and prying upward. Then it is possible to reach the cam set screw so that it can be removed and the arm tapped out.

When disassembling this type of unit, place in a vise and pull the arm down as far as it will go. (Continued on page 66)



**Let 'Em Down**

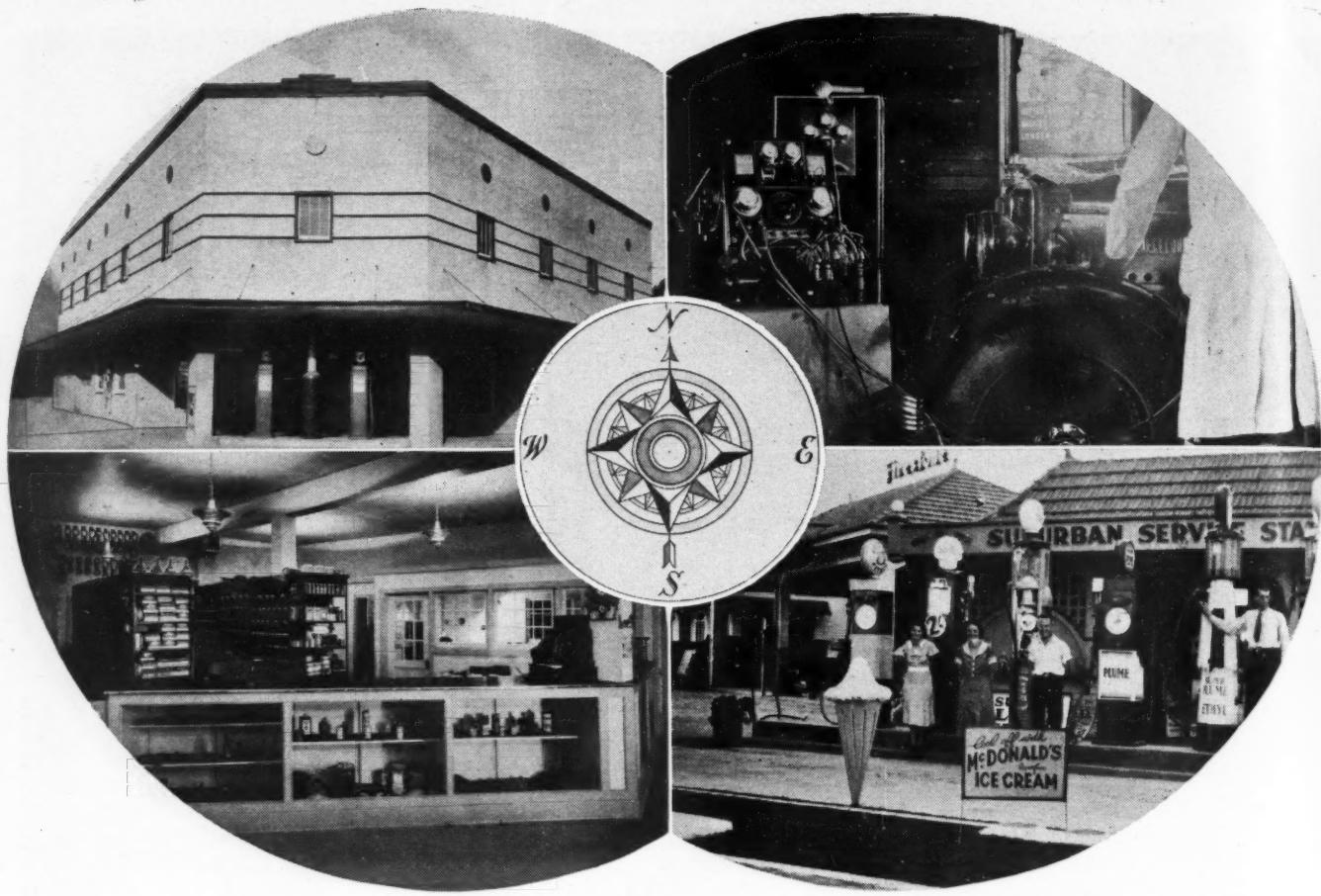


**EASY With Proper Shock Absorber Adjustments**



Top of Page, left to right: Filling the Monroe Direct-Acting type; sectional view of Single-Action type, showing adjusting valve; Two-Way type, or Double-Action; sectional view of Direct-Acting type.

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Left, The exterior of the Juneau, Alaska garage and its parts department, shown beneath it. Right, across the Pacific and southward to Claudelands, New Zealand for two views of a modern service station down there.

## Repair Shops At The Ends Of The Earth

IN Juneau, Alaska, . . . or in Claudelands, New Zealand, . . . the strong arm of maintenance reaches out to help car owners on every concrete line of the earth's face.

The function of the repair man and his maintenance shop grows more universal every day, for the group of pictures shown above were made in two shops thousands of miles apart.

The garage and parts department on the left is the new home of Juneau Motors Co., Juneau, Alaska. A modern building which offers real protection against the Taku wind, a "norther" which occasionally blows down on Juneau from the chill Taku glacier.

The extension of roads and highways in Alaska and economic con-

ditions which are generally good in this gold mining center, are responsible for an increasing number of new car registrations and for a growing volume of repair business at Juneau Motors.

Elroy Ninnis is president and manager of the concern, which incidentally holds a few new car franchises, including Ford, Studebaker, Nash and Lincoln.

**A**CROSS the Pacific and southward several thousand miles is located Morris Stores & Motors, Ltd., Claudelands, New Zealand. Ernest P. Morris operates this independent service station, two views of which are shown above, on the right.

Mr. Morris wrote to tell us how he increased his summer business.

His first move was to clean-up, paint-up, and brighten up his service station. To this he added new equipment and improved comfort facilities for travelers.

His next step was to write tourist agencies within traveling distance of his station offering the facilities of his shop and sales counter to all who passed through his town.

He studied the wants of the traveling motorist. He trained his assistants to double the sale by suggestion. He opened a fresh stock of canned meats, fruits, sweets, bagged sugar and in fact, everything the camping motorist required.

Twice a month he addressed direct mail to his regular customers selling lubrication, battery service, car washing and repairs.

Stress was given to the lubrication department. Customers were invited to wait and see their cars lubricated. And from this point the management took advantage of that opportunity to increase other maintenance sales.

# For Performance



## *R e c o n d i t i o n*

### *Valves and Seats*

NONE of the modern high compression engines will perform unless they are precision tuned. But no matter how accurately and carefully an engine is tuned, it will not perform unless the valves are seating.

Unfortunately too many mechanics have assumed that because an engine has only a few thousand miles on it and is fitted with the best of valves and valve seat inserts, that the valves are in satisfactory condition. Such is not always the case, particularly when the car is driven by a "cowboy."

Valves and seats have a tough time of it, the exhaust in particular, which is subjected to temperatures of approximately 1000 deg. Furthermore, some cylinder blocks and heads will warp as the result of heat causing misalignment of the valve seats. This will occur in only a few thousand miles

of travel. But once the cylinder has taken a "set" it will not distort any further. To overcome this initial distortion of the cylinder block, many mechanics have found it advisable to recondition the valve seats after the engine has travelled 5000 to 6000 miles. After this is done, the engine can be driven many thousand miles without requiring any further reconditioning. It is also claimed that fuel economy will be materially improved.

In connection with reconditioning the valves and seats, too much

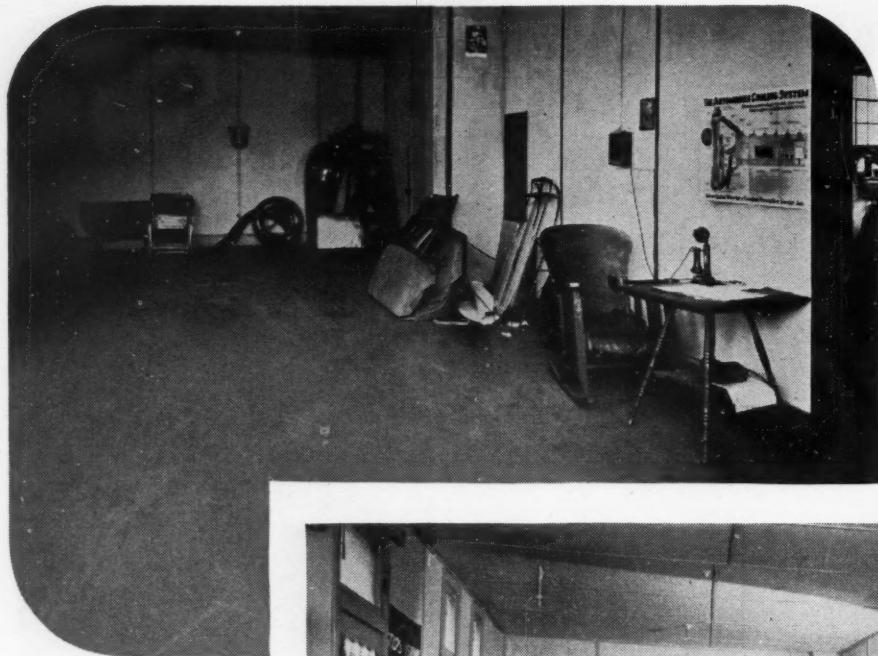
emphasis cannot be placed on the necessity for accuracy and the use of modern equipment, maintained in as near perfect condition as possible. Seats should also be checked with a dial gage and after reconditioning Prussian blue should be used as a final check on the work.

The amount of poor workmanship, that the Prussian blue test will show up, is almost unbelievable.

As an example of the necessity of more frequent valve grinding, many car dealers have the valves on their demonstrator cars reconditioned each week. Race drivers do the job after each race.

Since compression and valve reconditioning form the basis of a good tune-up job, the equipment required to do the work should be moved out front along-side of the engine testing equipment. In this way sales resistance will be reduced, the customer will see that you are prepared to follow through with the work and there will be less chance of the job bouncing back because of poor performance.





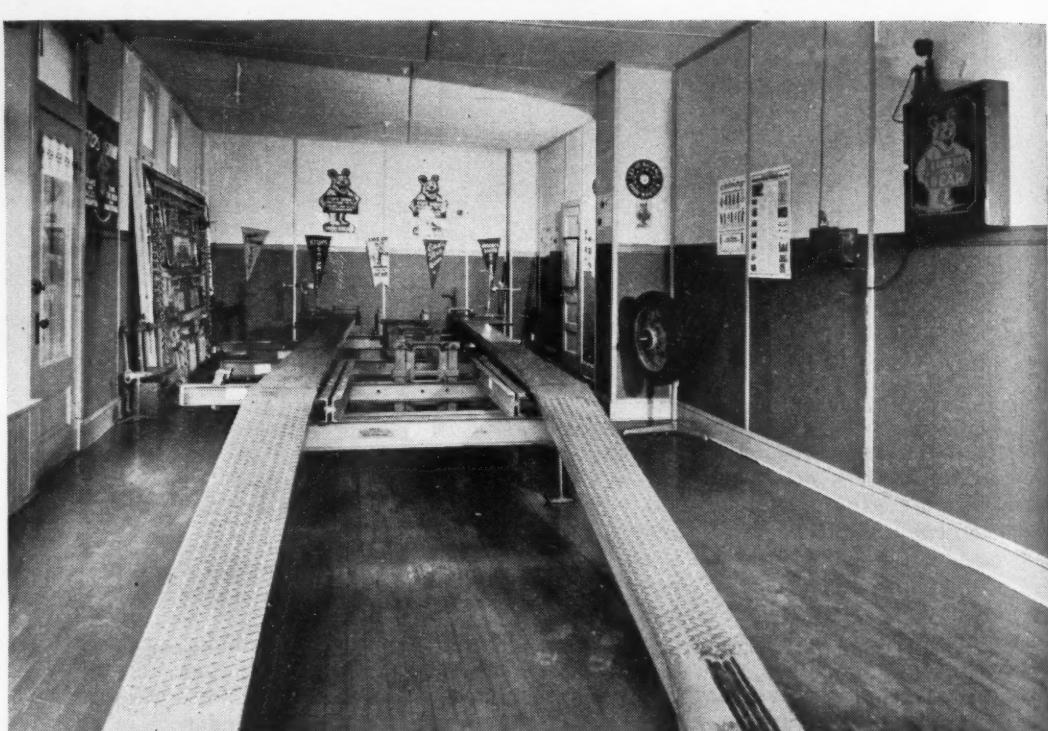
## “Before” and “After” Bigger Profits!

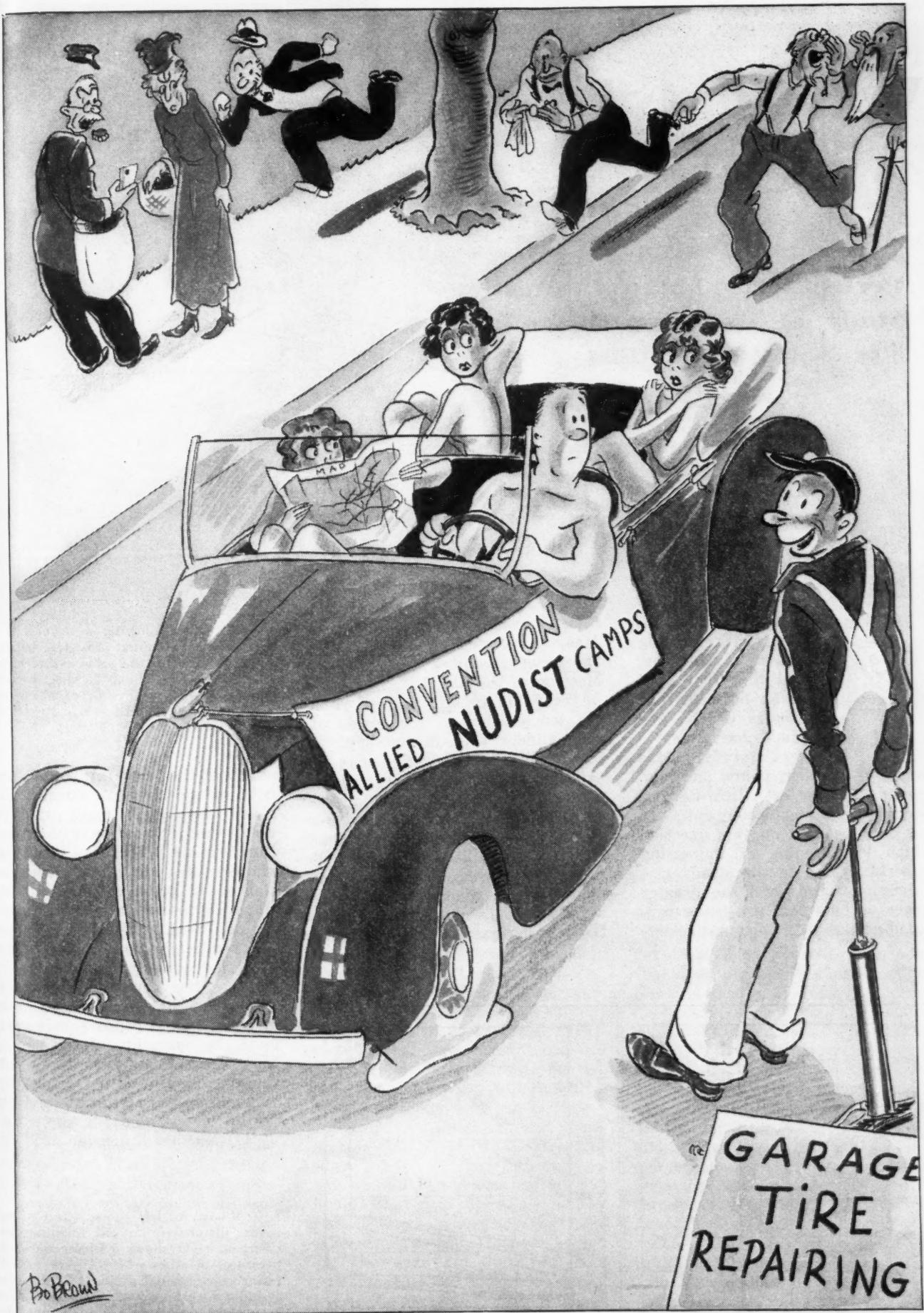
MIKE GOMOLA and Jake Berner operate a radiator and fender repair shop in Trenton, N. J. known as the Chambers Street Auto Radiator and Fender Works. Business had been pretty good for them—but they decided that it wasn't so good that it couldn't be made just a little better—if they tried.

Early this year they watched the Clinics for new ways to make money—and there they found the answer. Wheel alignment, frame and axle straightening was the logical step forward for their shop.

Adjoining their shop was a room used for no other purpose than to pile into it the miscellaneous junk that accumulated around the place . . . a baby carriage, a sled, old tire covers and so forth.

That room, which was just so much overhead, was turned into a daily profit maker when they cleaned it, painted (Continued on page 82)





*"You'll have to get out—if you want me to fix your tire"*

# What Causes Scuffing?

**Perfect Circle Makes Interesting Study of Cylinder, Piston and Ring Scuffing**

**By Don Blanchard**

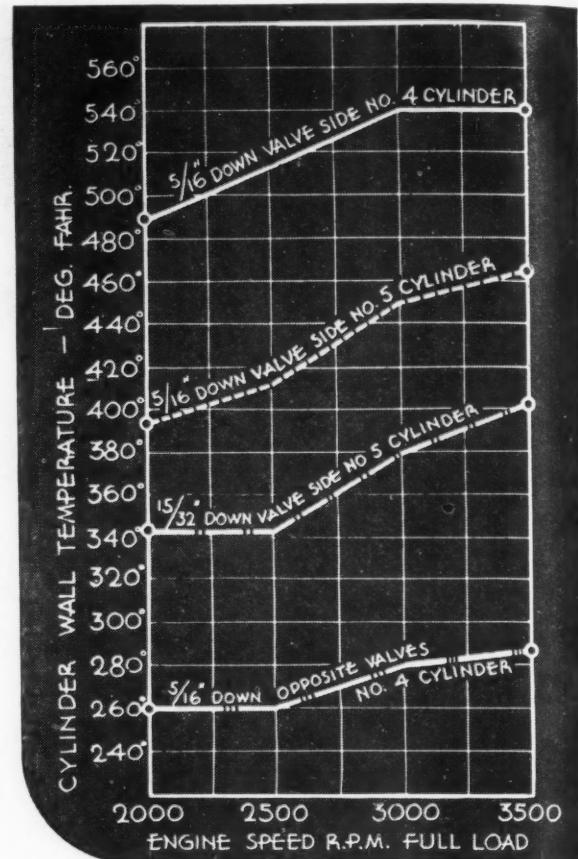


WITH cooling water at 160 deg. on one side of the cylinder wall and with burning gases at 3500 deg. on the other side, how hot does the inside of the cylinder barrel get?

In studying the causes of cylinder, piston and ring scuffing, the Perfect Circle Co. has developed some extremely interesting data bearing on this question which is becoming of increasing importance due to the steady rise in engine speeds and the greater power outputs that are being produced per cu. in. of piston displace-

ment. Some of the results of Perfect Circle's research were presented by Macy O. Teetor at the recent Summer Meeting of the S.A.E.

According to Mr. Teetor, when the temperature of the inside of the cylinder exceeds 400 deg. "a break down in lubrication may be expected permitting metal to metal contact." Obviously wall temperatures don't average above this mark. What does happen is that local hot spots develop in the cylinder barrel where the heat is not transferred to the cooling water as rapidly as the walls absorb it from the burning gases. Test data indi-

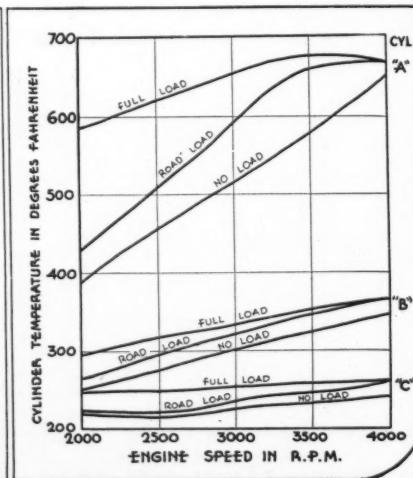
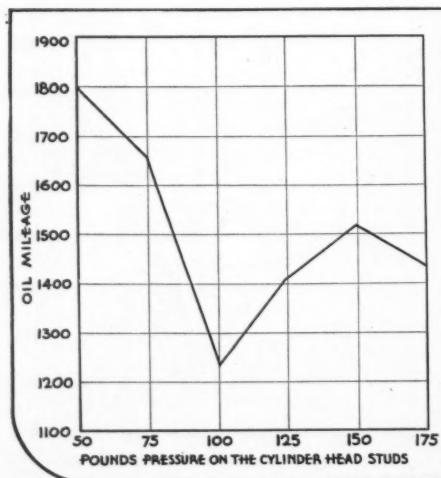


Above: Chart showing a difference in temperature of about 200 deg. between opposite sides of the same cylinder, and a difference of about 60 deg. between points on the same side of a cylinder wall.

cate that the temperatures of these hot spots may go considerably above the danger mark with the result that lubrication is destroyed. Furthermore, because the high temperatures are local, the expansion of the cylinder is not uniform which distorts it out of round causing additional difficulties.

When lubrication breaks down at a local hot spot Mr. Teetor continued, "the resulting damage to the face of the piston rings and the cylinder wall depends considerably upon the operation of the engine. If the metal to metal contact occurs when the engine is being operated at high speed, full load, and the engine is operated for some time

(Continued on page 84)



Left: Chart on left shows effect of cylinder distortion on oil consumption. Chart on right shows cylinder wall temperature variation with "A" curves indicating conventional design, "B" the same cylinder with improved water circulation around valves, and "C" an engine specially designed to eliminate hot-spots and distortion.



## It Takes Guts to be Free

By Julian Chase

NO one has exclusive right to concern for the underprivileged. No one exercises monopolistic control over sympathy for the underfed. No one can rightly claim for himself alone a deep, heartfelt desire to help his less fortunate fellow men. These laudable characteristics are part of every decent man. They are by no means the distinguishing marks of any one, of any group of men or, least of all, of any political party. Good will and good intentions are common attributes of all but the meanest and—it is well for all of us—the meanest make up a minute minority. They couldn't cast a big enough vote to carry the smallest county in a national election.

It is a part of intelligence and it is a particularly important part right now, to recognize this statement as a fact and to begin to do

our thinking after, and not before, the truth in it is accepted. If we will only see that this great country is not really divided into two large classes of people, one of whom would uplift the common man and the other of whom would crush him down and tread on his neck; if we will only see that the common virtues of kindness, benevolence, altruism and real charity and the uncommon vices of tyranny, ruthlessness, and cruel indifference do not follow political party lines, we shall be able more intelligently, more dispassionately and more profitably to consider the real fundamentals of the vital issues of today.

If we can agree—and we surely should—that good intentions can be credited to the overwhelming majority of our people; if we can agree that the wish and hope of this great majority is to see the condition of the common man improved, we can save a lot of valuable time in attaining that much desired end.

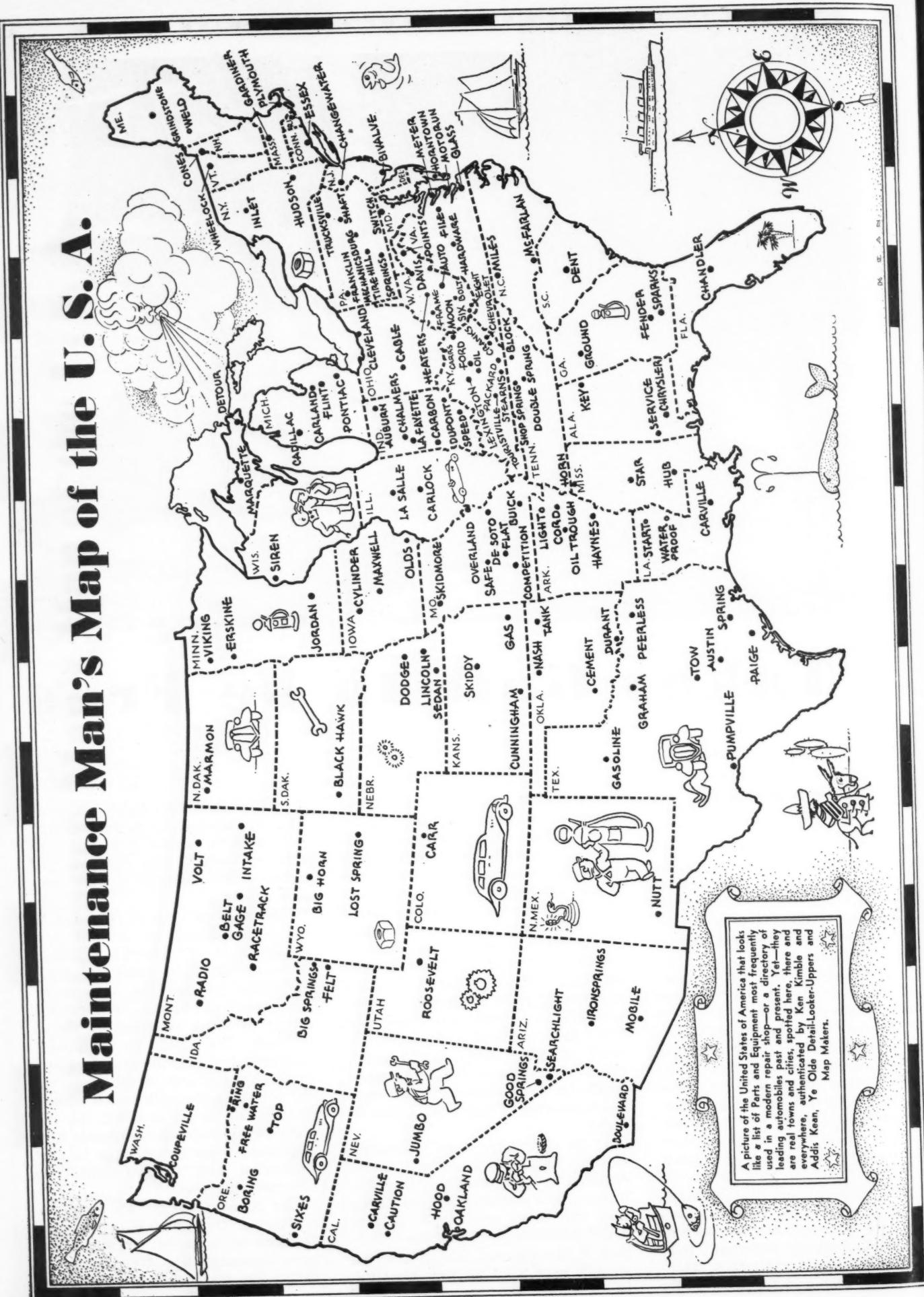
We can take our thoughts off profitless accusations as to motives and put them to useful work in considering means and methods for the accomplishment of a great common purpose.

The real question of the day is not what should we do but how should we do it? On that question there is plenty of room for wide difference of opinion and much wholesome discussion. We cannot afford to think superficially about methods. We should be criminally negligent not only to ourselves but to the generations to follow if we did not think through to the logical and, so far as we can tell, the inevitable end of all proposals for departure from or changes in our time-tried and long fought for American System.

Our country has grown great on individual freedom. We won our freedom as a nation by war. We have defended our freedom as a nation by war. Our country was

(Continued on page 81)

# Maintenance Man's Map of the U. S. A.



A picture of the United States of America that looks like a list of parts and equipment most frequently used in a modern repair shop—or a directory of leading automobilia past and present. Yet—they are real towns and cities, spotted here, there and everywhere, authenticated by Ken Kinkle and Addis Kean, Ye Olde Detail-Looker-Uppers and Map Makers.

# Adjusting The Ross "Twin Lever" Steering Gear

## New Steering Mechanism Facilitates Parking Maneuvers

A NEW type of steering gear, known as the Twin-Lever, has been added to the line of the Ross Gear & Tool Co., Lafayette, Ind. One of its advantages is that it gives the driver a greater mechanical advantage when the front wheels are swung far over to one side, as required in parking maneuvers. In the chart, herewith, the lower curve shows the variation of the over-all ratio of the steering mechanism with angular distance from the central position for the standard type of Ross cam-and-lever steering gear, while the upper curve shows the same thing for the Twin-Lever type of gear. The improvement in this respect is due in part to the gear itself and partly to changes in the steering linkage made possible by this gear. It will be noted that within the range of 15 deg. and more to each side of the central position (or what is known as the parking range), the mechanical advantage is nearly doubled.

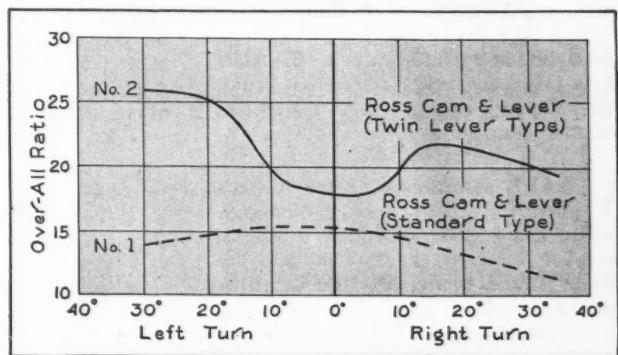
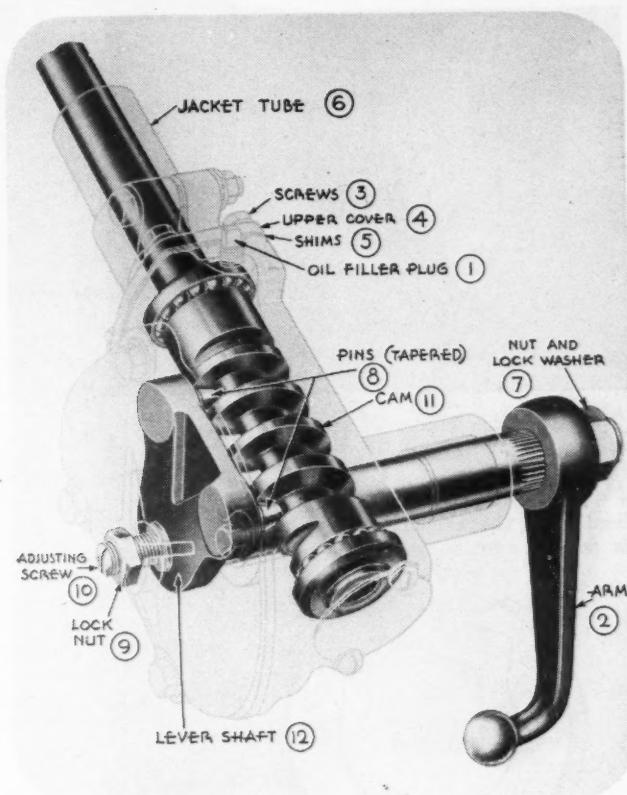
Within the normal driving range, with the front wheels in or close to the straight-ahead position, two studs are in contact with the cam, whereby the unit pressures at the contact areas are reduced, nominally 50 per cent. As the gear moves away from the central position, into the parking range, all the load comes on a single stud, but the effective leverage of the single stud increases

rapidly under this condition, and in the extreme position the effective leverage is 45 per cent greater than in the standard Ross gear.

While the adjustment of the new Ross "Twin-lever" steering gear follows closely the procedure for the "cam and lever" type, it is necessary that the various operations be performed in a systematic order, to be sure that the gear is properly adjusted.

The gear should be lubricated with STEERING GEAR LUBRICANT, and not with ordinary grease. A filler plug (1) is provided at the top of the housing; this should be removed and the gear lubricated every 5000 miles.

All adjustments should be made with the front wheels in a straight ahead position, and the steering lever pins in the center position. The drag link should be disconnected from the pitman arm ball, to relieve the gear of all strain.



Top: Phantom view of the new Ross Twin-Lever Steering Gear, showing points of adjustment.

Above: Chart showing variation of over-all steering ratio with steering angle.

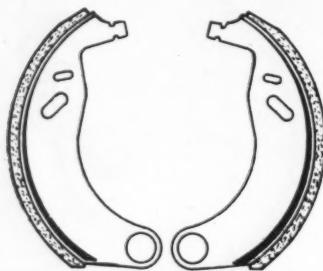
The first adjustment is to take up end play in the steering tube. Before making this adjustment, loosen the housing side plate adjusting screw and lock nut (9 and 10), to free the pins in the cam groove. Unscrew the four clamp screws (3) and move up the housing upper cover (4) far enough to permit removal of shims (5). A combination of 0.003 in., 0.010 in., and 0.030 in. shims is used in between paper gaskets. Remove shims as required so that, when the housing upper cover is tightened in place

(Continued on page 52)



## Service Hints From the Factories

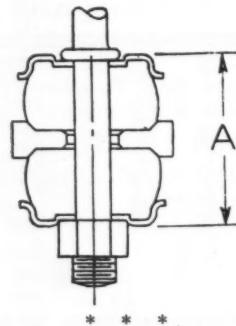
ALL brake shoes on the 1935 and 1936 Studebaker models are identical with the exception of a cut-out in the rear brake shoes for the hand



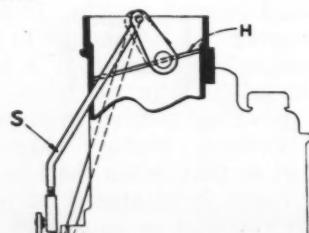
brake actuating mechanism. To simplify service stock, only rear brake shoes are supplied on orders for either front or rear shoes.

\* \* \*

A SMALL amount of castor oil applied to rubber spring bushings and to the rubber bushings in shock absorber links of the Pontiac models will be found to be effective in eliminating squeaks.



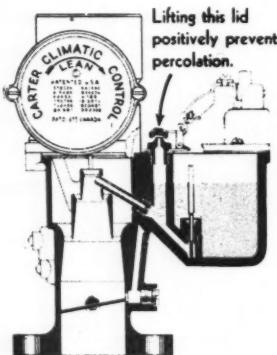
IF the 1936 Studebaker Dictator choke shaft lever interferes with the air cleaner, the lever may be reversed on the shaft so that the long part of the lever is placed closer to the carburetor and away from the air cleaner.



THE windshield header board of all 1936 Chevrolet models is already provided with screw holes to accommodate the right-hand sun visor. Feel through the headlining with a needle to locate these holes before attempting to attach the sun visor. Be sure to provide enough slack in the headlining before installing the sun visor bracket, so that the lining will not tear when the screws are tightened.

\* \* \*

HARD starting when the engine is hot may be caused by improper adjustment of the anti-percolating device in the Carter carburetor as used on the 1936 Oldsmobile. This is adjusted by first placing a .020 in. wire gage between the edge of the throttle valve and the throat of the carburetor

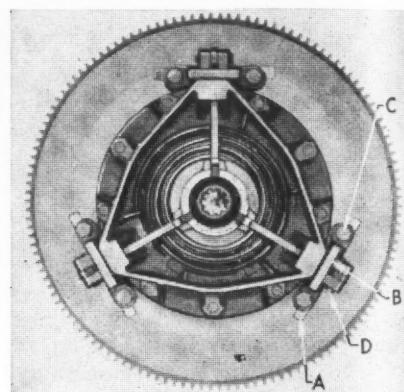


opposite the idle port, and then adjusting the lip on the metering rod arm to provide from .005 to .015 in. clearance between the lip and the anti-percolator valve stem. This is to allow the anti-percolator valve to open when the throttle valve is closed.

\* \* \*

CASES of water leak at the cowl of the 1936 Graham models may be caused by some of the holes that are punched in the shroud panel to hold the hood lacing not being plugged. These holes should be plugged to prevent water from entering and running down on the inside of the front compartment. Also check to be sure that the windshield rubber weather strip is properly sealed to the glass.

IT is important that the manifold heat control valve stop used on the 1934 Studebaker Commander (B) should be turned so that it does not



make contact with the heater valve arm during warm weather. The stop was intended to restrict the amount of opening of the manifold heater valve during cold weather operation, but if the opening is restricted during warm weather, loss of power will result. This stop is located at the outer rearward exhaust-to-intake manifold bolt.

\* \* \*

IN the 1936 Graham Cavalier and Supercharger models an occasional case of a hydraulic knock may appear. Usually this knock will pass away after a few thousand miles. If the case is annoying to the owner, it may be corrected by installing a short flexible tube in the oil gage line at the gage, and by inserting small rubber grommets at the gage mounting screws. Parts for making this correction may be secured from the factory.

\* \* \*

THE generator charging rate of the Chevrolet Master DeLuxe models may be temporarily increased by pulling out the lighting switch to a position between the "off" and "parking" positions. With the light switch in this position, the resistance in the field circuit is cut out, which increases the generator charge to the battery.



## They Learned About Maintenance from

# HER

"I STARTED my girls' softball team as a hobby," confesses Mark C. Bloome, operator of a number of service stations in Los Angeles, "but that hobby has turned into a valuable advertising medium."

Twice a week, the Mark C. Bloome team of girls appears before crowds of softball enthusiasts in scheduled softball league games. And, what is more important, the team sponsor's name on the uniform of each player is constantly before the spectators of these games. Newspapers have devoted no small space to softball teams, and plenty of action pictures appear in the big Los Angeles daily papers. Needless to say, the sponsor's name also appears in the news photographs.

Proof of the value of the team as an advertisement lies in the fact that a great number of softball enthusiasts drive their cars into Mark C. Bloome's service stations every day to inquire about the team, and incidentally buy some

gas and oil and other service from Mark C. Bloome.

Since the sport of softball is strictly amateur, the sponsor's only expense to maintain the team is a salary for the coach and the nominal cost of uniforms worn by the girls. And Mark C. Bloome will be glad to tell you that that expense is a well-paying investment.

There are many ways in which alert garagemen can tie in with sporting events—baseball, football, ice hockey and others—to merchandise their service. That is, by sponsoring teams, offering free passes to events, and displaying pictures of leading players in show windows.



### Auto Show Dates

National Motor Truck Show, Newark, N. J.	Nov. 3-7
National Automobile Show, Grand Central Palace, New York	Nov. 11-18
Boston	Nov. 14-21
Columbus	Nov. 14-20
Chicago	Nov. 14-21
Detroit	Nov. 14-21
Washington, D. C.	Nov. 14-21
Cincinnati	Nov. 15-21
St. Louis	Nov. 15-22
Philadelphia	Nov. 16-21
Pittsburgh	Nov. 16-21
Brooklyn	Nov. 21-28
Cleveland	Nov. 21-28
Kansas City	Nov. 21-29*
Milwaukee	Nov. 22-29
Baltimore	Nov. 26-Dec. 5
Peoria	Nov. 30-Dec. 5*
Automotive Service Industries Show, Chicago	Dec. 9-13

\* Tentative dates.



## Radio Receiver Provides Clue For More Business

MODERN short-wave radio broadcasting gave the boys at Hart's Repair Service, Chicago, an idea. Here's what they did to help themselves to some additional wrecking business and general repairs.

In their shop, located on a main highway leading out of Chicago (they operate another near the center of town) they set up a short-wave receiving unit, which is tuned in on the south-side Chicago police department radio broadcasting station. That's the station located nearest their shop.

The men in the shop know the police department numbers of squad cars which are assigned to the Automobile Accident Investigation Bureau. They listen for these numbers.

Broadcasting over the radio goes on practically all of the time but the repairmen pay no attention to it until one of these automobile investigation cars is mentioned by number in the broadcast.

The police message might be, "Car So-and-So make investigation at corner of "Such-and-Such." At that moment one of the men drives a wrecking truck to the scene of "police investigation," and within fifteen minutes he's back with a repair job.

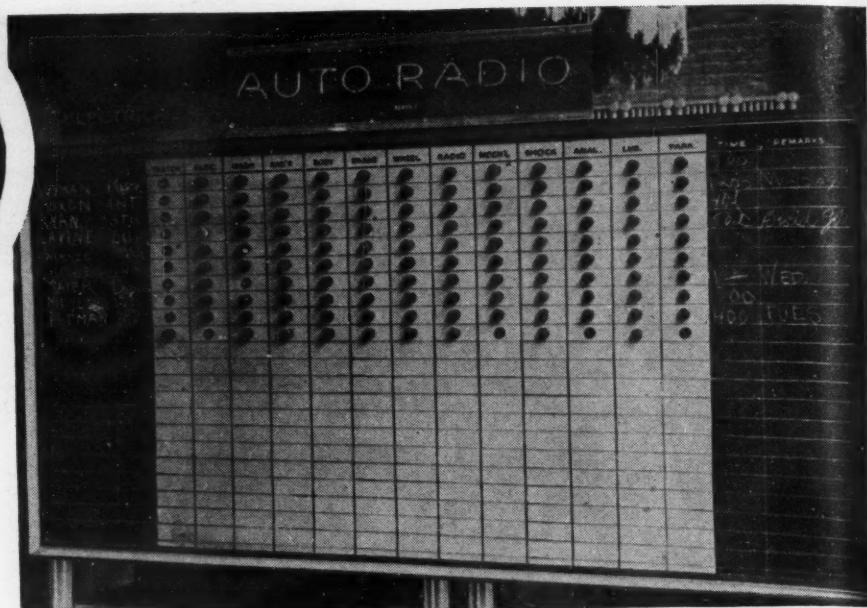
588

### **Red Lights On "Progress Board" Speeds Up Work**

**A**n old-fashioned blackboard, used to mark the progress of jobs through the shop, has blossomed with lights at United Motor Service, Inc., 1434 Callowhill St., Philadelphia.

1434 Callowhill St., Philadelphia.  
The board, shown at the top of this page, was designed by A. E. Torker, manager of the shop. The progress of jobs are checked by red lights on the schedule board. As long as there is a red light burning, some repair job is not yet complete.

At the left-hand side two columns of the board are painted black, and the customer's name and make of car are written in chalk. The main section of the board is painted gray and divided into vertical columns. Each



# Profitable Ideas

*By Frank P. Tighe*

column has a complete set of lamps, one for every horizontal row of jobs. These lights are small 110-volt red bulbs connected in parallel. By screwing the bulb tight in its socket, it lights

The vertical columns listing each type of repair job are as follows: tester, electrical, wash, radiator, body, brakes, wheels, radio, mechanical, shock absorbers, analyzer, lubrication and parking. The right-hand side of the board contains a column for the time promised and for any remarks.

When a car enters the shop it is listed on the board and a light screwed tight under each type of job to be done. As each mechanic finishes his job on the car, he loosens the bulb under his type of service and the car is turned over to another man for the next job.

This board not only speeds up

repair work, but makes quite an impression on customers, giving an immediate impression of an efficiently operated organization.

29

## **Gasoline Door-to-Door Deliveries—In Bulk!**

HERE'S a service station operator who added a substantial volume of gasoline and oil sales by bringing his service to his rural customers' doors.

Tank truck deliveries to farms and a few service stations in an area 25 miles square are the means used by Ayers Hawley and his son, Walter H. Hawley, in building one of the biggest rural gasoline and oil businesses in the neighborhood immediately west of Dayton, Ohio.

Exide

Exide HY-CAP

WAY DOWN DEEP

YOU'LL FIND EXIDE BEST.



The Hawley's have two service stations. The truck sales are made to farmers who use from 100 to 1000 gallons, quantity users being allowed 2 cents off the regular price of 18½ cents. Sales of 25 or 30 gallons are passed up for the larger ones, customers phoning in the orders to the stations, and truck deliveries going out any time from 5:00 a.m. to 10:00 p.m.

The gasoline is trucked in from barges on the Ohio River at Cincinnati. Hawley's use a ton and a half Chevrolet truck, with a special tank

body built by a local boiler maker, the complete cost of the job being \$980. It has a capacity of 800 gallons of gasoline and 310 gallons of motor oil. Cost of operation is 4½ cents a mile.

### Deep Stuff

MORSEMORE Battery and Service Station of Palisades Park, N. J., created a lot of interest among car owners with a realistic, deep sea, Exide window display. The idea, so far as we have been able to learn, was planned by Morsemere and later used by the Reliable Magneto Repair Co. of Paterson, N. J.

The picture on the left shows the battery exhibit. It is operated electrically and goes through a complete cycle by pushing a button mounted outside of the window. The fish move, the lobsters battle and the star fish creep around. Then the diver pulls the signal cord and the Exide battery, which is hidden, is hoisted to the surface. At night the scene is made even more realistic by the lighting.

\$ \$ \$

### Emergency Service By Plane

A MECHANIC of the Callister Garage of Tremonton, Utah, used this plane (on the left) to speed up service on repair parts from the Sherman Automobile Co., Salt Lake City, Utah. Two mining men on their way to visit mining interests broke down in his town and in order that their lay-over would be as short as possible, quicker contact was made with remote Tremonton by plane from Salt Lake City. The miners lost less time and appreciated his service.

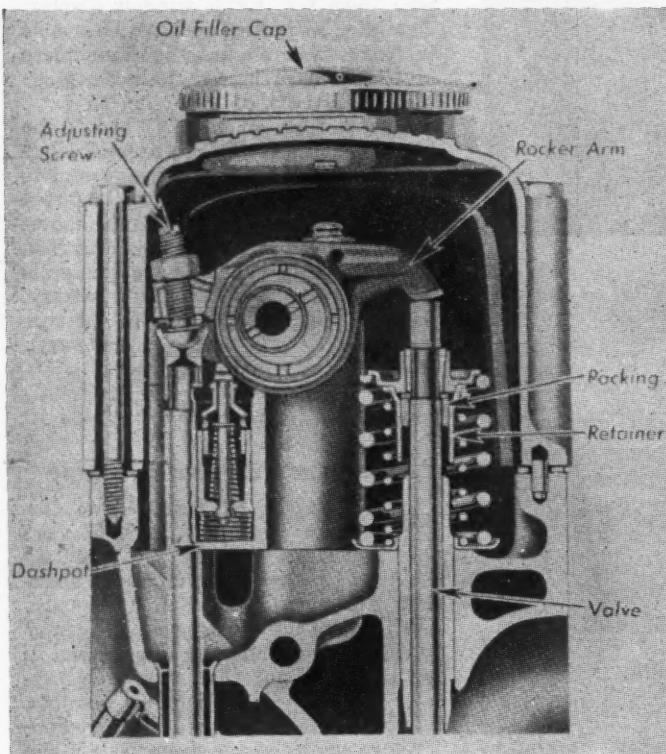


Hawley's truck-to-farm selling idea (illustrated on the left) added 10,000 gallons to his regular gasoline sales. And, in addition, created a bigger volume of stop-in business as the result of his farmer contacts.

### Drop Us A Line

NOW that you have read another bundle of successful selling ideas —would you like to cooperate with readers of MOTOR AGE? Tell us, by letter, what you are doing to improve business and how you do it.—F.P.T.

# The Readers' Clearing House



## PUTTING THE "SILENCE" IN VALVE SILENCERS

I am having a little trouble with noisy valves on a 1931 Cadillac V12. This job has hydraulic valve silencers and I can't get them quiet. We ground the valves on this car a week ago and set the clearance at the valve to zero, yet these silencers set up an awful clatter. Looked through some back numbers of MOTOR AGE, hoping to find some information on this subject, but was not successful.

The noise all comes from the plungers striking the rocker shaft. Some of the plungers seem to work right. They keep a tension on the rockers. Now why is it that the rest of them do not keep this same tension? I can't see any adjustment that will put these plungers in their proper place, so will you please send me the desired information?

I hope you can give me some information that might help, for I don't want this owner to change his good opinion of us. Robert Koepen, 334 South Main Street, rear, Butler, Pa.

**I**N TICE If from your letter that you set the valve clearances at zero when the cylinder head was reinstalled following the valve and carbon job. I believe this is the cause of your trouble, and I would suggest that you go back over the job and check it according to the following instructions.

You no doubt have noticed that there is a hole in the side at the top of the plunger used in this silencing mechanism, and the first step is to take a sharp instrument like

the ordinary ice pick and bend the edge so that the point sticks out at right angles to the shank. Insert the point in the hole in the plunger and push the plunger all the way down. This is to force the oil out of the dash pot so that the automatic adjuster is not in operation. Then, adjust the valve rocker arm so that there is 0.040 clearance between the end of the valve stem and the rocker arm. After this operation is completed and the engine is started, it will be very noisy for a few minutes until the oil has a chance to work into the automatic adjuster. Then, the 0.040 clearance will be taken up and the valves will be quiet.

There are two principal causes of noisy silencers and they are first, dirt in the silencer assembly that prevents it from taking up the excessive clearance, and the other is a stoppage in the rocker arm shaft which prevents a sufficient amount of oil from reaching the silencer. It is a good plan to clean out the rocker arm shaft if there is any question about its being free so that you are sure a sufficient amount of oil will reach the silencer.

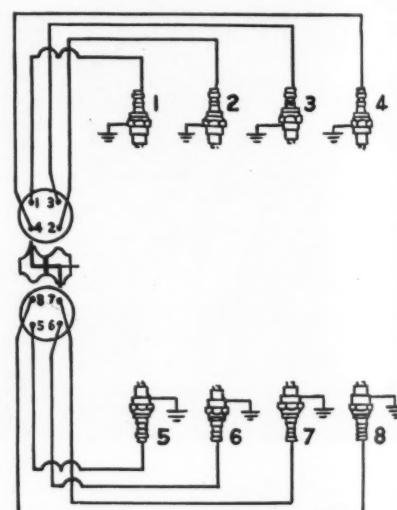
I feel sure that if you will set the tappets according to the above procedure, the job will turn out all right.

## WANTS INFORMATION ON 1936 FORD

Please furnish information on how to time ignition on 1936 Fords in case the spark plug wires have been removed. And why the distributor assembly has to be put in synchronize machine.

State also how the fuel gage and oil gage operate. Laurence Colbrey, Glendive, Mont.

**I**AM attaching hereto a sketch showing the wiring diagram from spark plugs to distributor. The ignition timing on a V-8 Ford is a point at which you cannot be very far wrong, since the distributor can only be installed in one position. The slotted screw on the right hand side

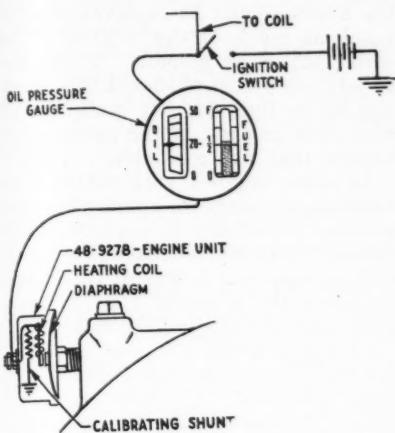


of the distributor permits a small range of advance and retard. The recommended setting is 4 deg. or 1 1/4 flywheel teeth before upper dead center. If you do not have a gage, it will be necessary for you to set the ignition timing according to the performance of the engine on the road. Loosening the slotted screw and moving it either up or down will change the timing slightly; moving the screw upward advances the ignition. After you have secured the proper adjust-

## Bill Toboldt

Editor of Motor Age

Continues to answer the ever-increasing number of questions written to the Readers' Clearing House. Robert "Hank" Hankinson, technical editor, lends a helpful hand in conducting this department. These experts invite you to discuss your mechanical problems with them. When writing please use your business letterhead or attach a business card, to indicate your connection with the automotive trade. Name and address will be withheld from publication on request.



ment at this point, back off the vacuum brake adjusting screw until the engine pings under a load and then turn the adjusting screw in just enough to remove the ping. The first cylinder on the right bank is number one and the first cylinder on the left side is number five. The firing order is 1-5-4-8-6-3-7-2.

It is not absolutely necessary that the Ford distributor be checked in a timing fixture. It is easy to understand, however, that such a procedure would be a much easier method of checking the distributor than having to check it on the road. As far as synchronizing is concerned, there is nothing that can be done in view of the fact that both sets of breaker points are fixed. The secret of the whole thing, however, is to be sure that the breaker point gap is exactly the same on both sets of points. In other words, the point gap should be between 0.012 and 0.014 in. That means that both points should be set either at 0.012 or 0.014 in., but one point should not be set at 0.012 in. and the other at 0.014 in., they both have to be exactly alike. If you will check this point pretty carefully and then set the adjusting screw for the advance and retard of the ignition in the center of the scale, you will not be far wrong. On the road, however, it may be possible for you to advance the ignition a trifle by pushing up on this adjusting screw as described above.

The oil pressure gage is an electrical unit and operates by making a contact through the medium of a set of points in the engine unit of the

gage. This unit is made up of a diaphragm which deflects according to the amount of oil pressure in the engine. As this diaphragm expands, it makes a contact through the points mentioned above and the electrical current flows from the engine unit to the dash unit. The dash unit is constructed in a similar manner as the engine unit and operates according to the amount of current communicated to the gage by the engine unit. There is nothing you can do if this gage does not register properly except to replace it with a new one.

The fuel gage operates very much in the same manner as the oil gage. The unit in the gas tank is composed of a special material and in construction is similar to a thermostat. As the float lever rises or falls, according to the amount of gas in the tank, the action of the thermostat causes electrical current to be transmitted to the dash gage. In the dash gage is a unit similar to a rheostat which regulates the amount of current registered by the needle of the gage in proportion to the current transmitted to the dash unit by the tank unit. Like the oil pressure gage unit, it is not possible to repair either the tank or the dash unit of the fuel gage. If trouble is experienced, the only thing you can do is to replace the unit.

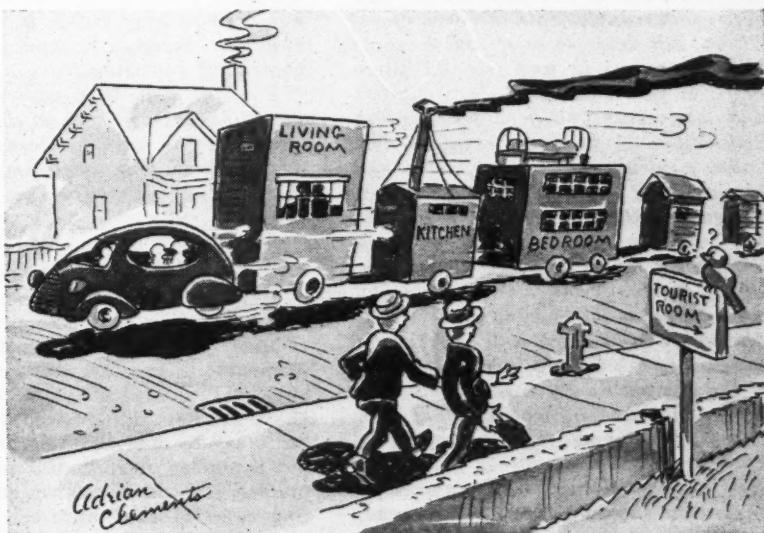
### TRACTOR VALVE SEATS

#### DEVELOP BAD LEAKS

I'm writing you for a bit of advice concerning a Minneapolis tractor model 17-30B, tractor No. 7080, Motor No. 8862, 4 cylinders. This tractor has been run on gas all of the time with some water for pre-ignition.

Everything runs free, with ample power and easy starting. The valve timing is O. K. The water pump circulates the water through both cylinder heads and only rarely on very hot days need there be any water added to the radiator. The compression is good and the oil works freely to all parts, keeping everything well oiled.

After using this tractor two days, the valves leak badly. After grinding the valves, they are good for another



Car Designer—"Look, Charlie, why not embody the comforts of home under one roof?"



*"The new stenog in the office wants the carbon cleaned!"*

two days, and so on. This tractor has given this trouble from the very start. Three different sets of valve seats have been put in and the old valve seats in the head have been cut out and steel seats and good steel valves installed—but with no results. The valves continue to give out at the end of two days' work. Leaks appear on various exhaust valves. The factory has just sent two new heads which have been put in and I've ground the valves again. The valve seats warp out of true as well as the valve itself. The valve stems are well oiled. The mixture in the carburetor seems O. K. If the gas needle valve is opened up a little, black smoke escapes and if it is closed off too much the engine fails to work properly.

If you can give me any suggestions as to what should be done in this case, I would appreciate your advising me.

Of course, as yet we are unable to see what the results are from the last

work on the tractor; but all along it has been nothing but trial and failure and that becomes exasperating after continued repetition.

I might add that various adjustments have been tried on clearance of valve tappets with no improvement.

Awaiting your assistance.—E. R. Bartsch, Rapidan Garage, Rapidan, Minn.

IT would certainly seem that you have tried about everything possible in an endeavor to overcome the valve trouble you are experiencing on a Minneapolis tractor. However, after carefully studying your trouble I think the first thing I would do would be to try to operate the tractor without a muffler or if it does not have a muffler, I would disconnect the exhaust line close to the manifold. I would also make sure that the exhaust manifold is clear and not obstructed in any way. The reason for this is that if

there is any back pressure present it will result in the exhaust valves running at excessive temperatures.

While you state that the engine does not overheat, I would recommend that you scrape out all the accumulated rust from the interior of the water jacket, paying particular attention to the portion around the valves. I do not know if this engine has side plates on the water jacket or whether it has core plugs. Naturally, if it has side plates, these should be removed to facilitate the scraping away of the accumulated rust. If core plugs are used, these can be taken out and also the heads should be removed so as to reach as much of the interior of the water jacket as possible. It will also be advisable to supplement this scraping by boiling out the water jacket with soda or some of the prepared solutions that are available.

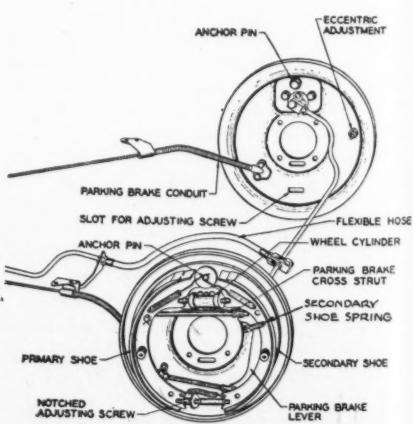
In some engines with which I am familiar a change in spark plugs has assisted materially in overcoming the trouble which you are experiencing. In this connection, I would recommend that you try a cooler type of spark plug than the one you are now using.

I think it would also pay to make a careful check of the carburetor and intake manifold. If there are any manifold leaks present it would result in a lean mixture which in turn results in higher combustion chamber temperatures. These higher temperatures make it tough for the valves and valve seats.

## EXPLAIN HAND BRAKE MECHANICAL HOOK-UP

I would like to have an illustrated booklet on these new Bendix hydraulic brakes with mechanical operation hand brake on rear wheels. Do they work with single or double plungers? A. E. Hermans, 6001 Corson Avenue, Seattle, Wash.

I AM sending you a cut showing the hand-brake cable entering the brake housing and also showing the parking brake lever to which the cable is connected. You will notice



that a rod called the parking brake cross-strut is inserted in the housing,

one end of the strut rod being placed in a slot in the parking brake lever and the other end being attached to the forward brake shoe. The parking brake lever is pivoted on a bolt in the upper end of the secondary brake shoe. You can readily see that this forms a leverage so that when the brake cable is pulled forward the strut rod presses the primary shoe out against the drum, and the self-energizing action of the type of brake actuates the secondary shoe so that a good brake contact is made.

This sort of operation can be applied to either single or double piston wheel cylinders.

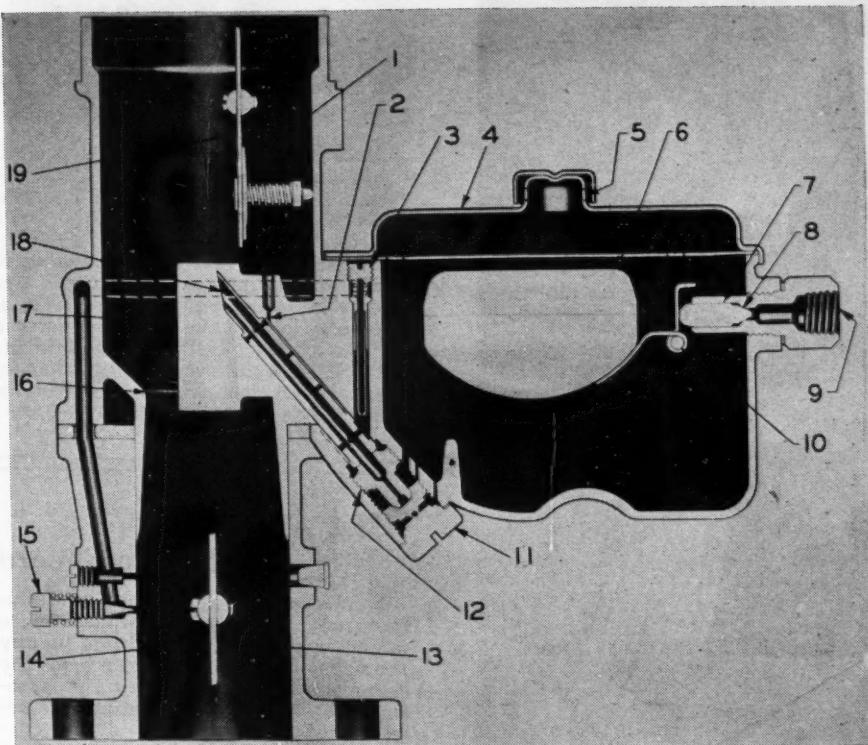
A hook-up similar to this is used on Lockheed hydraulic brakes on which the hand brake mechanically applies the service shoes in the rear brake.

### EXHAUST VALVE STEM KEEPS STRETCHING

I have a Plymouth P.A. 1932 that is giving me trouble with valves stretching in No. 2 cylinder exhaust port. Previously to this car I had one in 1929 that did the same thing only in No. 1 cylinder exhaust. In the first case I seemed to cure the trouble by reseating the valve head below the surface of the block. Now, I don't want to do this in this case.

I have combed this block fore and aft, transposed the valves and springs. Obtained new valves, the best that can be gotten with copper core and also others. Tried lighter springs. The valve that stretches in No. 2 will behave in any other. The ones that behave in any other, stretch as soon as installed in the trouble center. If I drive this car at 45 m.p.h. all is O.K. but if I set out from here to Phillie or Baltimore and I'm in a hurry, by the time I get there I have a miss and I simply adjust the tappets and all is Jake again. This goes on until there is no further tappet adjustment possible. I then take the head off, install a new valve and proceed as before. The thing that gets my goat is that as far as I can learn I'm the only one who has had two cars that do this thing.

What do you figure I've left un-



done? I've been into the water passages, searched them out for stoppage. This scheme of sinking the valve down is not so hot as it kills the pep to a degree. Can you help me out of this? R. D. Pusey, The Blackbird Garage, Blackbird, Del.

YOUR problem with the stretching valves on the Plymouth is one of the toughest ones that I have had in a long while. No one seems to have had similar trouble and I can't cook up any theories that will really hold together.

About the only sensible idea that I can think of is that there was some error in machining the cylinder block with the result that the valve spring on the valve that is giving the trouble is compressed to a greater degree than the other with the result that it stretches the valve stem. The same result could be obtained if the valve guide was not driven in the block sufficiently. I would suggest that you measure the distance from the bottom of the valve chamber to the point where the valve spring contacts the cylinder block. In that way, you compare the various valves.

I would also suggest that you take one of the valves that has stretched and measure its diameter carefully with a set of mikes so as to ascertain the points at which the most stretching takes place. Possibly, this will enable you to locate your trouble for, if the stretching takes place close to the head of the valve, it would indicate that it is caused by excessive heat. On the other hand, if the stretching takes place close to the end of the valve stem, it is most likely caused by excessive spring pressure.

If it is a question of heat, it would

### WANTS CARBURETOR DATA

Could you obtain servicing data on the Stromberg carburetor fitted to the 1935 Dodge cars? H. B. Adams, 88 South Road, Brighton, Victoria, Australia.

IN accordance with your request, I am attaching hereto an illustration of the carburetor used on the 1935 Dodge and I am also giving you the calibration and the different adjustment settings. I trust that this information will meet your requirements.

certainly seem that either the water jacket is clogged around that particular valve port or that the exhaust port is clogged in some manner. In this connection, you might remove the exhaust manifold and make sure that it is absolutely clear. Further in this connection, I would suggest that you carefully examine the intake manifold for any leaks, paying particular attention to the gasket, for if number two cylinder, the one in which the valve is stretching, is receiving a very lean mixture, it will result in excessive high temperatures which would, of course, make it tough for the valve.

If this job is fitted with valve seat inserts, it is possible that the insert is not making a good contact with the block and consequently it transfers heat very slowly with the further result that the valve runs at excessive temperatures.

I would appreciate your letting me know how you make out with this job as it is very unusual.



You wanted your body tightened, didn't you?

# Accomplishment vs. Utopia

## Macaulay Cites Motors as Pacemaker of American Industry; Contrasts Results with Visionary Claims

Declaring that the factual accomplishments of the automobile industry are "a challenge in practical results to communism, socialism and false Utopias," Alvan Macaulay, president of Packard Motor Car Co. and the Automobile Manufacturers Association, spoke before the annual meeting of the association in Detroit, July 15.

Pointing out that the automobile worker was making more per hour than in 1929, with living expenses 20 per cent lower, and that because of stabilization efforts he is enjoying a larger real annual income than in the boom year, Mr. Macaulay labeled the motor industry as "the pacemaker of American Industry."

"The automobile industry," said Mr. Macaulay, "bears no charmed life; it is not spared while others suffer depression. Its sales in the period 1930-1932 decreased 74.5 per cent, representing a shrinkage in wholesale value of \$2,784,000,000.

"But during even the worst years the industry was never stagnant, and by its progressiveness and alertness was always ready to take full and rapid advantage of any change for the better. But inherent to the industry's methods and necessary to its success is the system of free competition under which this country has always developed."

Mr. Macaulay continued with a citation of the progress the industry had made not only within itself but directly and indirectly throughout a vast number of other industries.

In conclusion the speaker said, "We are confronted in this country with the spread of communism. Many of the factors acting today as a deterrent on business and industry are socialistic in form and character. Contrasted with these conditions is the automobile industry's success in stimulating buying, increasing employment, stabilizing employment, raising wages and sharing other benefits with all employees. These factual accomplishments should stand out as highly significant and worthy of the thoughtful study of the American people. The automobile industry's record may be pointed to as one implicit in the system which has given this country prosperity and its high standard of living. It is once again demonstrating the aims of industry to treat fairly and humanely its factory workers."

## '35 Gasoline Consumption Showed Increase of 6.4%

Gasoline specifically taxed for highway use in 1935 totaled 16,264,012,000 gal., according to latest estimates by the Bureau of Public Roads, Department of Agriculture. This is an increase of 6.4 per cent over the official estimate for 1934 which amounted to 15,292,012,000 gal.

In addition, 811,000,000 gal. were sold during 1935 subject to full tax refund, and 97,586,000 gal. were subject to a partial tax refund, making the grand total, 17,160,339,000 gal.

THE Tri-Boro bridge, a traffic artery stretching over seventeen miles, connecting Long Island, Manhattan and the Bronx, New York, opened to traffic last month.

Eleanore Whitney, movie star and tap dancer "does her stuff" on a Pontiac turret top.

A novel outdoor advertising display for a service station, as seen in Berlin, Germany.

## Twenty-Nine Makes in N. Y. Show; Trailer Section Planned

Twenty-three makes of passenger cars, six of trucks, will be on the floor when the National Automobile Show opens in New York on Armistice Day. Demand for space reduced size of allotments in some cases.

At least three makes of tourist trailers will be shown. The Diesel-engine and shop equipment exhibits will be larger than last year. Action at the factories, safety on the highways will dominate the decorations and exhibits.

The following makes of passenger cars and trucks were allotted space at the national show:

Passenger Cars — Auburn, Buick, Cadillac, Chevrolet, Chrysler, De Soto, Dodge, Duesenberg, Graham-Paige, Hudson, Hupmobile, LaSalle, Lafayette, Nash, Oldsmobile, Packard, Pierce-Arrow, Plymouth, Pontiac, Reo, Studebaker, Terraplane, Willys-Overland.

Commercial Vehicles — Chevrolet, Dodge, Plymouth, Reo, Studebaker, Terraplane.

## Eyston Sets 106 Records At Bonneville

As a sequel to adversities that threatened his world speed record attempt at Bonneville Saltbed, Captain George Eyston, of England, wrote the astounding list of 106 records into the books on July 6 and July 12 and 14.

His newest achievements were catalogued by the Contest Board of the American Automobile Association, governing body of speed competition and auto racing, in the following brackets: World Unlimited, 20 record; International Class "A," 20 records; American Unlimited, 33 records; American Class "A," 33 records.

In quest of these marks will be Ab Jenkins, America's No. 1 distance record king, who, according to the AAA Contest Board, will race over the same course at Bonneville that Eyston circled for 48 hours without a letup. Jenkins has left the East and will begin his record assault within the next few weeks, it was announced by Ted Allen, Contest Board Secretary.

Eyston, in driving his huge 12-cylinder "Speed of the Wind" car powered by a Rolls Royce engine, shattered a number of marks held by Jenkins and by John Cobb, his fellow countryman who plans also to come to the United States in September for another try at the records list.

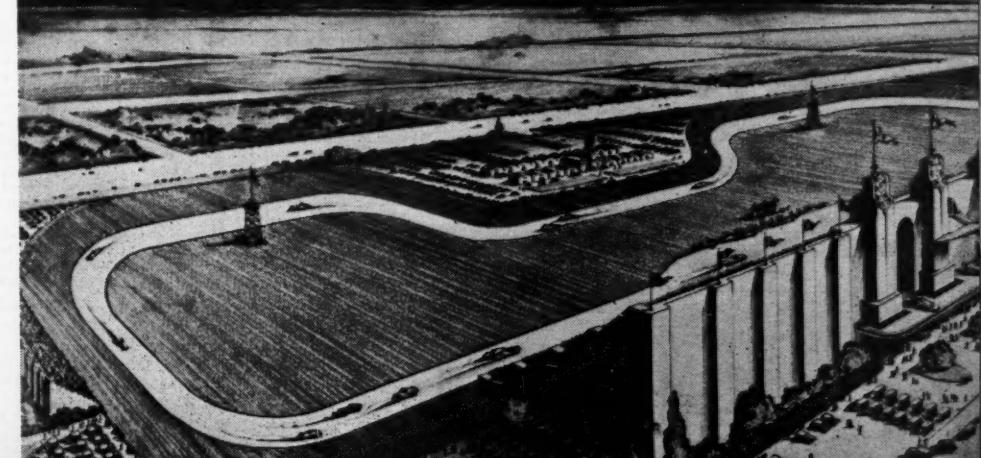
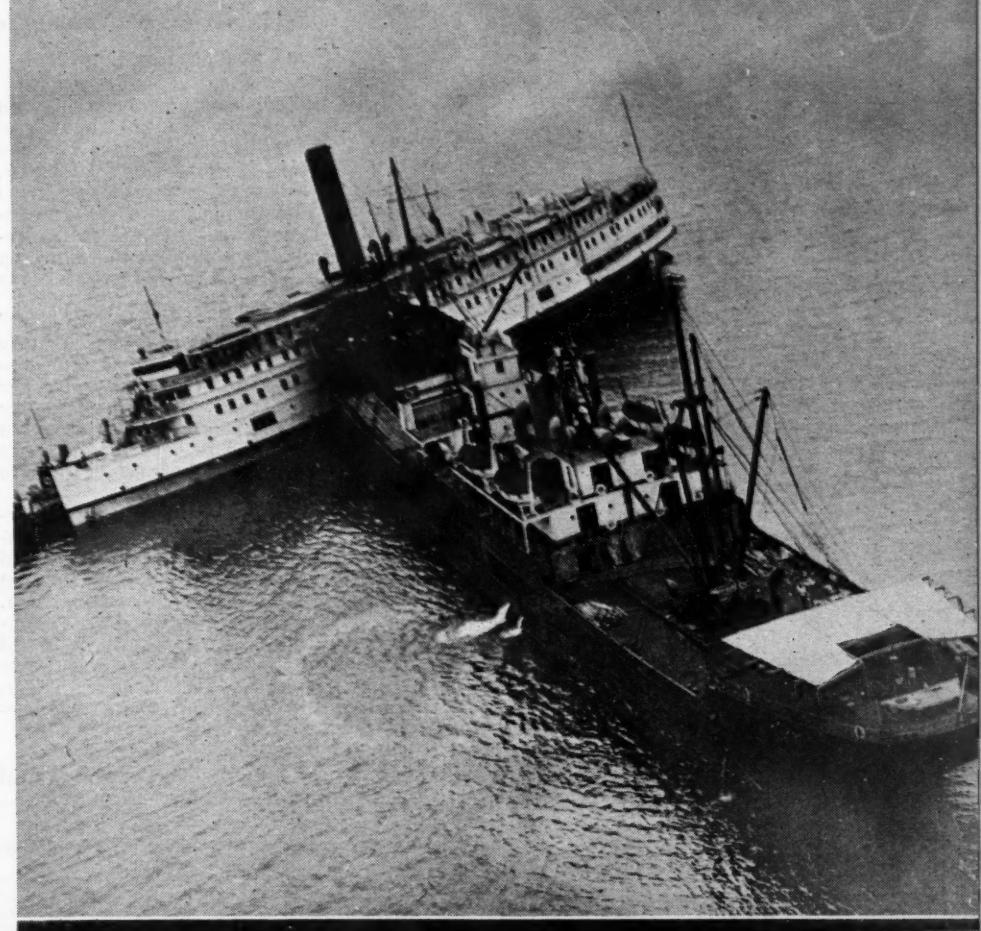
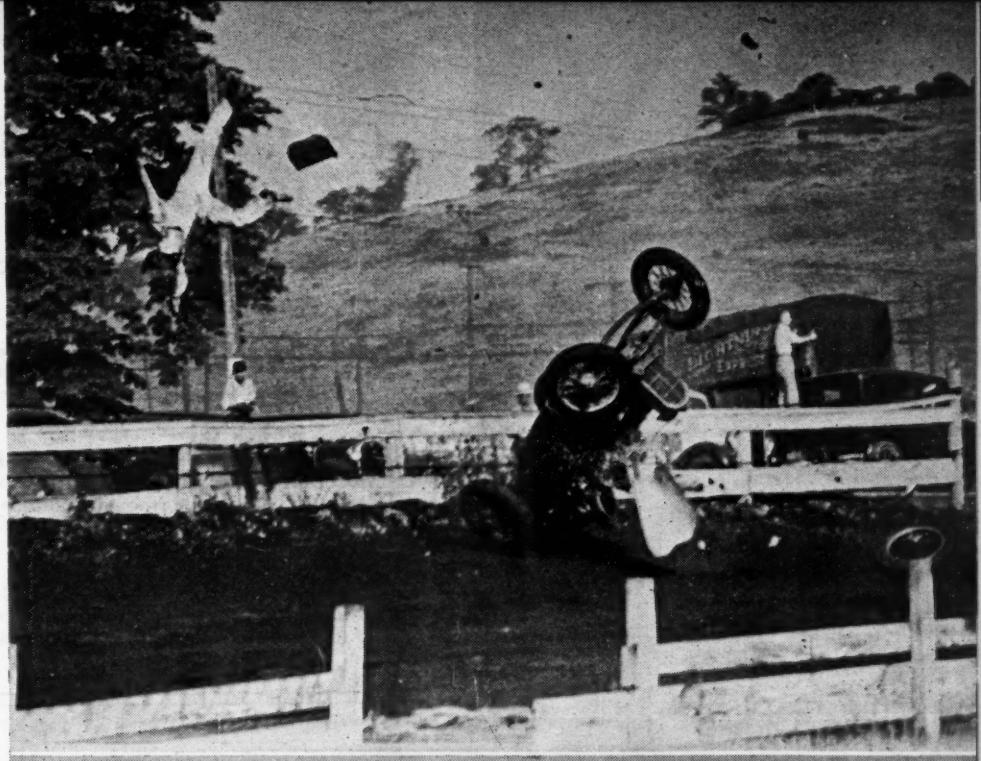
After establishing new records for the mile and kilometer for Diesel oil-burning cars early this year, Eyston waited weeks for proper conditions to begin his gasoline-engined run. On July 6, he received the "go" flag from Art Pillsbury, AAA Contest Board's west coast representative, and on that day he established a list of short distance marks that proved to be only an inkling of what he finally accomplished.

Before Eyston could get under way for his attempt at the longer distances, a strong gale swept over the famous salt flats and nearly demolished the camp set up in this remote section to handle the records run. When the wind had subsided and camp was reset, Eyston was again sent away from the starting tape. With all going well, he experienced (Continued on page 42)

AN unusual photo taken when two racing cars collided at Arden Downs, near Washington, Pa., last month. "Wild Bill" Cassidy went spinning through the air, and was seriously injured.

End of a dealer convention. Members of the Maryland Automotive Trade Assn. narrowly escaped disaster when an ocean freighter plowed into the liner on which the association was holding its convention, last month.

An architectural drawing of the proposed Los Angeles Raceway, described on page 42.





## A.A.A. Contest Board Sanctions New "Million Dollar" Los Angeles Raceway

### The Pictures, down the column:

Solid fuel, made by a distillation process from coal, drove a 5-ton lorry 100 miles in England, recently. A fuel saving of 60 per cent is claimed.

The new "fresh air" taxicabs, with sliding roofs, now in operation in New York City. The DeSoto division of Chrysler Corp. furnished chassis on the entire fleet, totaling 2,200 cabs

Film beauty demonstrates magnetic broom. They use it in Hollywood to pick up nails and metallic objects on the movie lots.

### Eyston Sets New Records at Bonneville

(Continued from page 41)

minor difficulties that held him in the pits for nearly a half hour and thus threatened to slice his average below record possibilities. However, with his relief driver, A. Denly, who assisted him to his list of records established at Bonneville last fall, Eyston was able to complete the run at a pace that surprised even the experts in the sport.

His list of marks include "the book" up to 48 hours, during which time he traveled 6,544.757 miles at the astounding average of 136.349 miles per hour. In almost every instance he surpassed the former record by a wide margin and in several marks he broke records that had stood for two years.

His World's Unlimited and International Class "A" records were immediately cabled by the Contest Board to the International Association in Paris for world-wide recognition. These are indicated on the accompanying table. World's Unlimited and International Class "A" records were from standing start; American Unlimited and American Class "A" records were from flying start.

Automobile racing's major circuit has gained its "second wind" in the current "comeback" with announcement of another million dollar racing course. This newest track, a counterpart of the Roosevelt Raceway now under construction on Long Island, will be built on the north side of the Municipal Airport in Los Angeles, Calif., and will be known as Los Angeles Raceway.

Already the inaugural classic has been assigned for the West Coast track in the form of a 500-mile International Sweepstakes to be run on Sunday, Nov. 29. The Contest Board of the American Automobile Association, national governing body of the sport, has approved plans for the Los Angeles Raceway and has issued its sanction for the premier which comes less than two months after the grand opening of the Atlantic Coast's newest major racing plant, the Roosevelt Raceway. A 400-mile International Sweepstakes is scheduled for the Long Island course on Oct. 12 and construction work there is well under way.

While similar in design and the creations of Art Pillsbury, engineer for the famous Beverly Hills Speedway in California which started the boom of board speedways many years back, the Los Angeles Raceway and the Roosevelt Raceway will not be identical. While the Roosevelt course is laid out for four miles with some 20 curves winding to 15 straightaways, the West Coast track will be closer to the design of Indianapolis.

Preliminary sketches show the Los Angeles Raceway with a long main straightaway and a back stretch that bends toward the home stretch. The exact length of the track, another of the road racing type courses, has not yet been announced but at Contest Board headquarters in Washington they say that the course will be at least two miles in length and might extend three miles. The Indianapolis Speedway is two and one-half miles and the new Roosevelt Raceway is four miles. The track will be a flat, paved course ranging from 70 to 90 feet in width. A paddock will provide

(Continued on page 78)

### Summary of Eyston Distance Records

Distance	Miles per Hour	Former Speed	Former Holder	Car	Place	Date
200 K	162.42	159.18	Captain G. E. T. Eyston	"Speed of the Wind"**	Bonneville	9/15/35
500 K	153.30	151.32	Ab Jenkins	Duesenberg Special	Bonneville	8/6/35
500 M	152.34	147.66	John Cobb	Napier-Railton Special	Bonneville	7/15-16/35
1000 K	151.52	145.01	John Cobb and T. Rose-Richards	Napier-Railton Special	Bonneville	7/15-16/35
1000 M	152.14	144.93	John Cobb and T. Rose-Richards	Napier-Railton Special	Bonneville	7/15-16/35
2000 K	151.94	144.21	Eyston, C. S. Staniland and A. Denly	"Speed of the Wind"**	Bonneville	9/16-17/35
2000 M	149.27	142.70	Eyston, C. S. Staniland and A. Denly	"Speed of the Wind"**	Bonneville	9/16-17/35
3000 K	148.82	144.09	Eyston, C. S. Staniland and A. Denly	"Speed of the Wind"**	Bonneville	9/16-17/35
3000 M	149.05	140.75	Eyston, C. S. Staniland and A. Denly	"Speed of the Wind"**	Bonneville	9/16-17/35
4000 K	149.40	142.16	Eyston, C. S. Staniland and A. Denly	"Speed of the Wind"**	Bonneville	9/16-17/35
4000 M	144.81	110.40	A. Perrot, M. Dhome and R. Girod	Delahaye	Montlhery	5/8-11/34
5000 K	149.24	140.43	Eyston, Staniland and Denly	"Speed of the Wind"**	Bonneville	9/16-17/35
5000 M	142.61	109.89	Perrot, Dhome and Girod	Delahaye	Montlhery	5/8-11/34
10000 K	137.45	104.72	Perrot, Dhome and Girod	Delahaye	Montlhery	5/8-11/34
1 Hour	162.53	159.30	Captain G. E. T. Eyston	"Speed of the Wind"**	Bonneville	9/15/35
3 Hours	152.17	147.62	John Cobb	Napier-Railton Special	Bonneville	7/15-16/35
6 Hours	151.73	144.64	John Cobb and T. Rose-Richards	Napier-Railton Special	Bonneville	7/15-16/35
12 Hours	149.02	143.98	Eyston, Staniland and Denly	"Speed of the Wind"**	Bonneville	9/16-17/35
24 Hours	149.096	140.52	Eyston, Staniland and Denly	"Speed of the Wind"**	Bonneville	9/16-17/35
48 Hours	136.349	109.54	Perrot, Dhome and Girod	Delahaye	Montlhery	5/8-11/34

\* 12-Cylinder Rolls Royce

K—Kilometers

M—Miles

## **ASI Show Rules Announced**

The Joint Operating Committee's plans for the annual Automotive Service Industries Show, to be held in the Navy Pier, Chicago, Dec. 9-13, inclusive, are rapidly taking shape. In two recent meetings practically all of the important rules and regulations have been acted upon.

A new regulation provides that the Joint Operating Committee will refund \$25 to one authorized representative of each active jobber member of National Standard Parts Association and Motor & Equipment Wholesalers Association, for attendance as required during the first three days of the show.

The only jobbers who will be admitted to the show during the first two days, Wednesday and Thursday, will be those who are members of either N.S.P.A. or M.E.W.A. Invited jobber guests will be admitted on the last three days, Friday, Saturday, and Sunday, and on the final day, designated as Trade Day, all repairmen will be privileged to attend.

Ruling on a matter which has been the source of considerable controversy in the past, the Joint Operating Committee has decided that members of the Automotive Booster Clubs who are not connected with a manufacturer member of either N.S.P.A. or M.E. M.A. at the time of the show, will be admitted only on Sunday, the final day.

## **Ford Makes Change in Interior Trim of Cars**

Improvements in the interior treatment of Ford V-8 de luxe and standard body types are now in production.

In addition to the interior changes, two new body finish colors are made available—armory green and light-fast maroon—which are standard in de luxe types. New accessories have been added in the de luxe types. These include a new sport-type steering wheel with spring steel flexible spokes, a pull-wind 30-hour clock recessed in the rear vision mirror and a glove compartment lock.

### **William I. Ralph Dies**

William I. Ralph, well known in the automotive industry and for many years vice-president of the Chilton Company, died at Atlantic City, N. J., August 3.

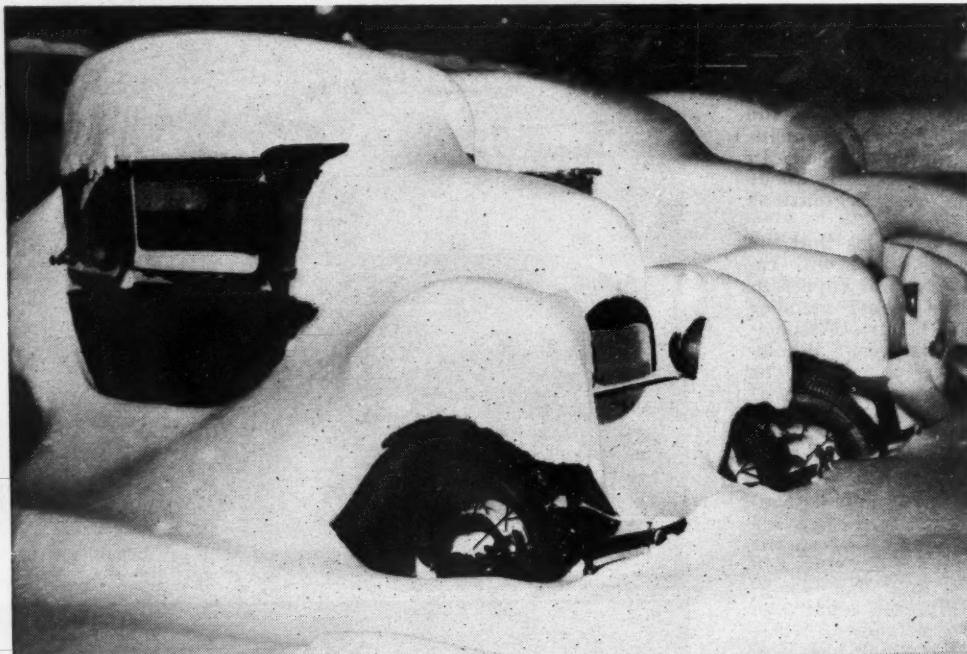
### Down the Column:

A super speed racing car used in the movies is once again rumored for an attack on the world's 24-hour speed record. The car is said to be capable of 180 m.p.h., is 27 ft. long and has a 675-hp. engine.

Marionette show at Chrysler Motors Hall, Texas Centennial. See page 65.

Footwork counted as well as driving ability at the French Grand Prix held recently at Montlhéry. The drivers toed the line, then raced for their cars when the signal was given.





**N**o, this didn't happen last month. But, if you can "remember when," you may be able to use this picture and your imagination to keep cool during the month of August.

## ***Michigan Maintenance Men Organize Cooperative Wholesale Buying Group***

Independent garage men of western Michigan have organized the Associated Automotive Supply Co., Inc., a cooperative wholesale group, with headquarters at Grand Rapids.

At the present time the organization is said to have a membership of 150 garage men and service station operators and hopes to boost that number to 500 by winter. All officers, with the exception of the general manager, are actively connected with the retail maintenance trade.

A. Wilber Davis, the general manager, is the only officer receiving a salary. Mr. Davis also is vice-president of the Davis Storage Battery Co., which recently moved its plant to Grand Rapids from Ludington, Mich. Other officers are: Herman Otte, president; Ernest Marshall, vice-president; Henry North, secretary; and C. E. Richardson, treasurer. The officers, with Nicholas Kiefer, another garage man, make up the board of directors.

According to the general manager, membership is divided into two classes: *A* for independent garages, which will be permitted to buy anything at the cooperative's rate of cost plus 10 per cent; and *B* for service stations, which will be entitled to the cost plus 10 per cent price on certain items of equipment, alcohol, tires, batteries, oil, spark plugs, bulbs, and fan belts. Members not maintaining resale prices will immediately lose all privileges, it is reported.

Non-member garages and service stations will be allowed to purchase parts and equipment at prices within 5 per cent of current prices.

Birth of the general cooperative for all parts and equipment resulted from

a successful experience with storage batteries. Mr. Davis suggested a cooperative selling plan on storage batteries to the local garage association, offering to sell to the group at jobbers' prices.

After sales had been stepped up to 750 batteries per month, the group made a study of handling other automotive products on the same basis. Mr. Davis, with the help of President Otte and Vice-President Marshall, perfected the plans for the organization, which has taken a three-year lease on a downtown business building.

The industry undoubtedly will watch this movement with interest. From time to time groups of service retailers have attempted to purchase their supplies cooperatively, but few have been organized on so extensive a scale. The Metropolitan Garage Association of Boston, an organization of operators of parking garages, has been buying such things as alcohol, batteries, tires, grease and oil cooperatively, but members depend largely on jobbers for all other products, Boston wholesalers say.

### ***Hydraulic Brake Fluid Leads New U. S. Rubber Accessory Line***

A new line of automotive accessories has been announced by United States Rubber Products, Inc., New York, N. Y. An all-season hydraulic brake fluid with an unusually wide operating range and a white rubber tire coating are expected to be the leaders. In addition, the new products include battery cables, radiator hose and a full line of automotive paints and chemicals.

### ***"King" Announces New Exhaust Gas Analyzer***

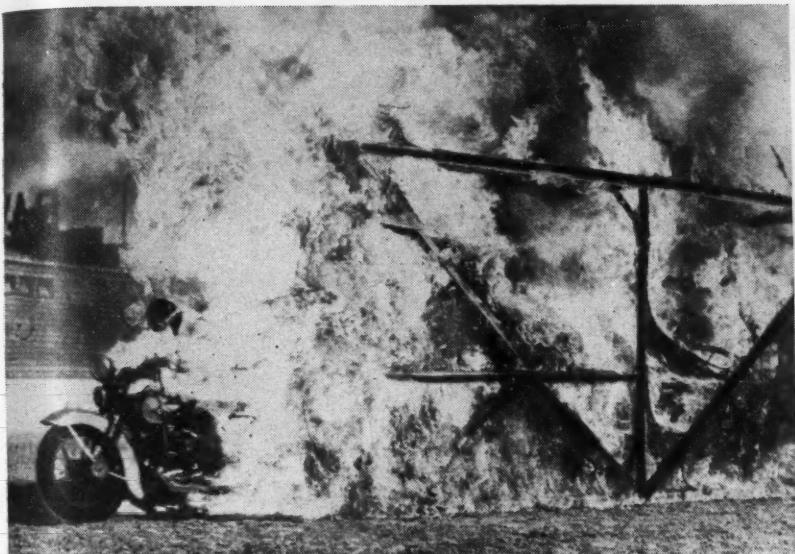
The Electric Heat Control Co., Cleveland, Ohio, makers of the "King



System" of motor tune-up equipment, announces the introduction of a new portable exhaust gas analyzer. It is described as weighing only 14 pounds, and as being adaptable for making road tests of final carburetor adjustments.

### ***Magnus Chemical Offers New Cleaner, "Magnusol"***

"Magnusol" is a new cleaner recently announced by the Magnus Chemical Co., Garwood, N. J. Described as being a soap that is soluble in either water or kerosene, it is said to provide an easy means of cleaning dirty motors and chassis, and removing grease from floors. It is claimed that Magnusol is not injurious to paint, and can be used in a water solution for washing truck and bus bodies.



Fire eater (top of page, left) demonstrates on a motorcycle at the Victor McLaglen Stadium, Los Angeles.

Balloon busters (top of page, right) at the recent Pontiac picnic, where fifteen thousand employees and their families enjoyed the third annual factory outing.

New service station (above) recently opened by Byers-Caldwell in San Bernardino, Calif. A \$16,000 independent super service station complete with modern equipment.

Harvard University experts have developed scientific tests to determine motorists' reactions to conditions that are apt to arise when driving. This is the steering test.

### N.S.P.A. Offers Uniform Plan For Equipment Financing

Repairmen who contemplate the purchase of shop equipment will be interested in the recent announcement by the National Standard Parts Assn.

In order to eliminate the difficulties that have arisen in connection with wholesalers' sales of automotive shop equipment under the many different time payment plans that have been offered since availability of the F.H.A. Plan was discontinued last April, N.S.P.A. has approved a new plan and working arrangement operating through the Commercial Credit Co. of Baltimore.

The plan, it is reported, is the re-

sult of careful study by a number of representatives of the Association's equipment manufacturing members and a group of N.S.P.A. jobbers, and is said to incorporate sound financing procedure based upon past experience and particularly in the light of the experience with sale of a large volume of shop equipment under the F.H.A. Plan.

The new plan, which will operate through 160 offices of the Commercial Credit Co., located in key cities throughout the country, provides for \$70.00 minimum sale, 10 per cent down payment, 24 months' loan period, minimum finance charge of \$6.00, broad insurance covering all forms of risk, a finance charge, in-



cluding insurance, of approximately 6 1/4 per cent, and a limited liability for both jobber and manufacturer, which is gradually reduced to 5 per cent of the total amount of all deals being handled by the company under the plan.

### New Rods for Light Gage Welding

"Thinweld," described as a specially coated electrode for arc welding light gage sheet metal, is now offered in 1/16 in., 3/32 in., and 1/8 in. sizes by The Hobart Bros. Co., Troy, Ohio. It is said to be applicable for auto body and fender work, and can be used on metal as light as 24 and 26 gage.



**T**WO views of the "Sun-Chasr," a new, lightweight tourist trailer introduced by York-Hoover Body Corp., York, Pa.

### ***Oil Company Leases Outlets; Quits Field***

A radical change in the retail field of gasoline and automobile oil distribution in eastern states was indicated recently when the Standard Oil Company of New Jersey announced that it had adopted, in part of its territory, the so-called "Iowa plan" of oil marketing, under which major oil companies withdraw entirely from the retail field and post only tank wagon prices, leaving operators of the filling stations to charge what they wish.

New Jersey Standard has placed the plan in effect at the leading centers in the District of Columbia and Maryland.

Announcement of the plan was followed by a statement from J. W. Van Dyke, chairman of the board of the Atlantic Refining Company, that "Atlantic Refining will give serious consideration to the subject of placing in effect the plan."

J. N. Pew, Jr., vice-president of the Sun Oil Company, said Sun Oil meets each situation in the oil industry as it arises.

New Jersey Standard has been divesting itself of ownership of retail outlets for some time. Individual purchasers of the outlets contract with the company to handle its products. In the State of New Jersey more than 75 per cent of Esso stations are owned outside the company and the percentage in New York and New England which are privately owned and operated is said to be much larger.

The chief object of placing retail gasoline stations in private hands, it was said, is to escape chain store taxes which have been levied in some states and which, initiated in Ohio, resulted in the "Ohio plan" of oil marketing. More recently there has been the incentive of the Federal bill on the same lines, applying to all states.

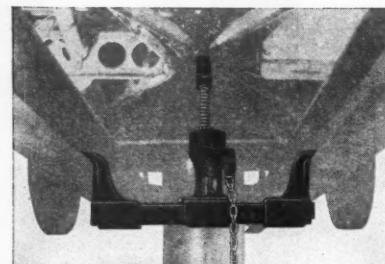
Operation under private ownership has, however, had the important effect of stabilizing retail gasoline markets, according to observers in the industry. New Jersey Standard is only one of several large companies which have taken action on these lines.

The chain store tax which forced

Standard Oil of Indiana and many other oil companies out of the company owned and operated service station field in Iowa a year ago is proving a boon in that leases which have been made to individuals are paying bigger returns to the company. Edward G. Seubert, president of Standard Oil of Indiana, reviewed the situation at the annual stockholders' meeting recently.

"We expect shortly," declared Mr. Seubert, "to take steps toward leasing many of our company owned and operated stations in Indiana, Wisconsin and Colorado."

### ***Manley Announces New Carfloater Lift Jack***



The Manley Mfg. Division of American Chain Co., York, Pa., has announced a new jack to be used to facilitate repair work while a car is on a lift. It is furnished in two styles, No. 417 for use on the drive-on type of lift, and No. 418 for use on the free wheel type. When not in use, it is said that the Lift Jack can be tilted out of the way by means of a specially constructed hinge. Operation of the jack is by means of a pull-chain.

### ***"Bonny" Bonfield Opens Up***

T. F. "Bonny" Bonfield, for many years associated with Lacy L. Redd & Co., Inc., of Philadelphia, has opened a modern service station under his own name at 4612-14 N. Broad Street, Philadelphia. Bonfield, with a good location on one of Philadelphia's main traffic arteries, and a shop full of new equipment, is specializing in merchandising and selling "tune-up" service almost exclusively.

### ***"Sun-Chasr" New Trailer Made by York-Hoover***

The "Sun-Chasr," recently put on the market by the York-Hoover Body Corporation, York, Pa., is a comfortable, low-priced trailer and is equipped with a couch-bed, having two inner spring mattresses. The couch may be extended at night into a double bed. Storage space is provided underneath. In the rear end there is a Pullman seat arrangement facing the center. A table between seats makes this end into a dinette. Storage space under both seats. The table may be lowered to the level of the seats, and with the cushions and backs laid flat, there is provided another double bed the same size as that in the front, thus making sleeping accommodations for four people.

The central portion of the trailer has solid panels and roof. The end roof portions are provided with weather-proof roof covers which are arranged for several adjustments. They may be folded to any intermediate adjustment, from the full enclosed position, which will expose both or either end of the trailer to the sun and air. Provision is also made for propping the ends out as an awning. Also the side covers are made to roll toward the center and fasten in a vertical roll, and providing a completely open section at each end. These end portions are completely screened in with bronze wire screen, for protection against insects. This design and the convertible features are also protected by U. S. patent.

The "Sun-Chasr," fully equipped for sleeping four, weighs 1270 pounds. Weight on trailer wheels when coupled to car, only 1095 pounds. Weight on coupler, 175 pounds.

It offers the advantage of comfortable sleeping quarters, clothes closets, cooking and eating space, a cabinet with ice-box, wash basin, water tank and faucet.

**A WORKMAN** on a bonus,  
High his prices made.  
He thought it helped his income,  
But he drove away the trade.

# Every Mail Piles Up the Proof.. America has Confidence in Pontiac and Pontiac Dealers

IN THE ordinary course of events, when a business man acquires an automotive franchise, he sets about two tasks: One is to build public confidence in himself and in the product he sells. The other is to turn the resulting confidence into sales. Newcomers to the Pontiac dealer organization, however, can get right down to the business of selling cars. Public acceptance can be taken for granted. *Established Pontiac dealers have already provided a groundwork of goodwill unsurpassed in the history of the industry.*

For proof, read the letters printed here. Remember that they are a faithful reflection of the opinions of

"Your dealer and his sales force are wonderful people to deal with. They try to make you feel at home and give you the best there is in service and salesmanship."

D.R., Erie, Pa.\*

"The first-class service rendered by your dealer is one of the chief reasons why I am a booster for Pontiac."

C.L.C., Clarksburg, W. Va.\*

"I have known your dealer many years and you are to be congratulated on having such a fair, honest representative. When I want to be sure of a square deal, I always see him."

H.H.J., Santa Barbara, Calif.\*

"If all of your dealers are as courteous as the one with whom I dealt, it is no wonder you have perfected the great sales organization that you have."

J.F.E., Shelbyville, Ind.\*

"This is my third Pontiac. Part of my satisfaction with the car is due to the excellent service rendered by your dealer. He is very painstaking and has given me excellent advice in regard to driving, handling and care of the car."

G.E.S., Roscoe, New York\*

"Your dealer bears the reputation of being the most courteous and efficient in town. My experience with them certainly proves that this reputation is deserved."

L.C.C., Asheville, N. C.\*

"Our reason for trying out the 1936 Pontiac and hence eventually buying it, was the excellent service given us by your dealer on our previous car and our faith in his integrity."

N.J., Billings, Montana\*

thousands upon thousands of other Pontiac owners. There is no way to set a definite value on such public confidence, but here are a few of its results. Only in one other June in Pontiac's history have Pontiac sales surpassed the June sales of this year. Contrary to the expected trend in the industry, July sales figures show no sign of the usual seasonal decline. Pontiac needs no further evidence that the cultivation of goodwill pays dividends. The parallel between the number of sales and the vast volume of letters from satisfied owners is too striking to be denied.

PONTIAC MOTOR COMPANY, PONTIAC, MICHIGAN

"It has been especially nice to deal with such a competent and fine dealer as you have here. He is very highly spoken of, and one may be sure of a fair and honest deal when purchasing from him. In fact his whole staff are reliable men and always willing to help a customer."

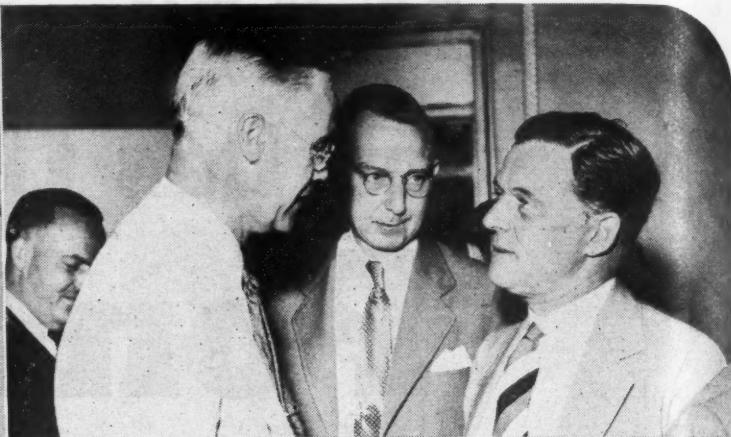
E.A.M., Michigan City, Ind.\*

\*Excerpt from a letter on file at the Pontiac Motor Company.

If you are interested in acquiring the Pontiac franchise, please communicate with C. P. Simpson, Vice-President and General Sales Manager, Pontiac Motor Company. Your communication will be regarded as strictly confidential.

**Pontiac**  
DIVISION OF GENERAL MOTORS



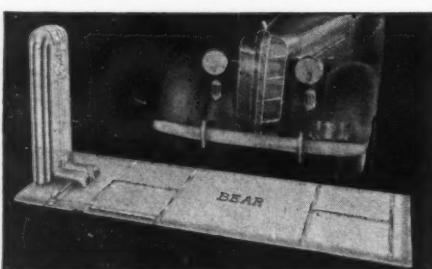


Leopold Stokowski (upper left), conductor of the Philadelphia Symphony Orchestra, takes delivery of a Lincoln Zephyr.

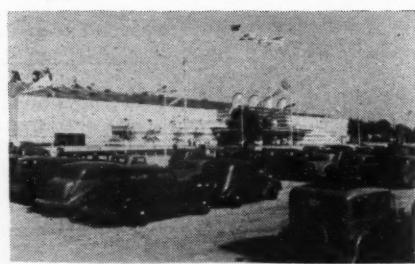
At the luncheon recess of a recent board meeting of the N.S.P.A. (top), L. F. Woolman, Allen Electric & Equipment Co.; L. G. Mathews, Sealed Power Corp.; R. D. Black, Black & Decker Mfg. Co.; and W. H. Richardson, Timken Roller Bearing Service & Sales Co. (Above) F. C. Kip, Automotive Thrust Bearings Corp.; H. A. Lightner, DeLuxe Products Corp.; F. A. Miller, U. S. Asbestos division of Raybestos-Manhattan, Inc., and A. C. Darling, Borg-Warner Service Parts Co. (Left) "And Sudden Death," a new movie, employed this brake-testing equipment as part of the props.

### Bear Introduces New Tire Scuff Detector

The latest contribution to safety equipment by the Bear Mfg. Co., Rock Island, Ill., is the Bear Tire Scuff Detector. It is said to register the slightest scuff or drag caused by wheel misalignment, as both front and rear wheels are tested as they come in con-



tact with the detector blades. No installation expense required, as the weight of the detector holds it in position.



### West Coast Show Big Success

With both exhibitors and spectators acclaiming it a success, the first Annual Automotive Maintenance Show and Wholesalers' Convention, which was held in the Pan-Pacific Auditorium, Los Angeles, Calif., for the benefit of automobile men in the 11 western states, surpassed the expectations of its sponsors, the Automotive Booster Club of Southern California No. 20.

Total attendance for the four-day event was 20,704, excluding 976 wholesalers and employees who attended the Wholesalers' Convention. Repre-

senting over half a million dollars' worth of automotive products, 149 automotive service parts, equipment, accessory, and chemical products firms maintained displays of their products at the show.

J. M. Noble, president of the Automotive Booster Club of Southern California, was directly responsible for the promotion of the show and acted as show and convention manager for the event. J. Leslie Morris officiated as chairman of the show committee, and was assisted by M. H. Linger and R. W. Cottle. W. P. Nash headed the convention committee and S. W. Jackson served as advertising director for the event. Members of the Rocky Mountain Chapter, the Golden Gate Chapter, the Seattle Chapter of the Automotive Booster Club, as well as the members of the Southern California Chapter, gave their cooperation to make the show a success.

Johnny passed a stick of gum  
To everyone who paid.  
It didn't cost him very much,  
And much good-will was made.

## Anti-Price Discrimination Law Passed; FTC Studies Effects

Late in June President Roosevelt affixed his signature to the Patman-Robinson anti-price discrimination amendment to the Clayton Act.

At the present time there is a great deal of uncertainty as to just what the law means and what its practical consequences will be. Moreover, doubts as to its enforceability are widespread. Only time and Federal Trade Commission and court decisions can clear up this confusion.

On the other hand, there doesn't seem to be much uncertainty as to the general intent of the new law. It is aimed largely at big buyers whose bigness, it is contended, has enabled them to get prices, and in some cases rebates, advertising allowances, etc., which were not justified by real differences in the costs of serving them. To end price discriminations of this kind, the new law makes it illegal to discriminate in price where the effect will be to lessen competition and to create monopoly, except where the differential in price is justified by difference "in cost of manufacture, sale or delivery resulting from methods or quantities in which said commodities are to such purchasers sold or delivered."

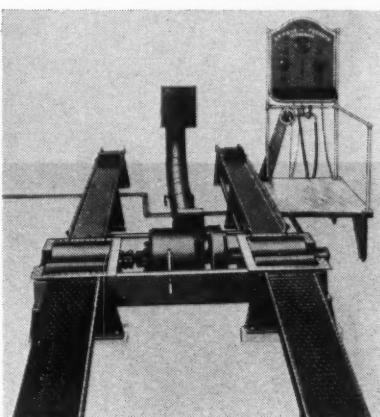
The Patman-Robinson law is being analyzed in an interpretative study by the general counsel for the Federal Trade Commission, its administrative body. The act has been the object of various interpretations by trade organizations, and the purpose of the F.T.C. is to clarify them as much as possible. No rigid rulings are expected and the F.T.C., it is said, will use the analysis of its chief counsel in the nature of a memorandum to set up the framework of its administration.

## Bendix-Feragen Chassis Dynamometer Announced

The Bendix Products Corp., South Bend, Ind., has announced the introduction of a chassis dynamometer, supplied in four sizes. It is said to employ water as resistance as well as a coolant. Engine compression tests, H. P. at any speed, gasoline mileage, exhaust gas back pressure, chassis noises, rear wheel bearings, bent



**HAPPY ENDING.** George "Doc" Mackenzie, Eastern racing champion, cracked up at Reading last month. While recovering from his accident, he shaved off his famous beard and married Verna Mather, artist model, of Langhorne, Pa. Floyd Roberts, also injured in the same crack-up, was "Doc's" best man.



axles, universal joint and propeller shaft vibrations and speedometer calibrations are some of the tests that are said to be possible through the use of this chassis dynamometer.



## Form-A-Gasket Test Car To Run On Roosevelt Raceway

The Form-A-Gasket test car, winner of the Daytona Beach race, is being tuned up for a trial run on the new Roosevelt Raceway, Long Island, according to its driver, Milt Marion, who piloted the Permatex entry to victory at Daytona last March. Marion is also building two other cars in preparation for the 400-mile racing event at the new four-mile track, Oct. 12.

Since winning the Daytona Beach race the Form-A-Gasket test car has been driven 17,650 miles without a single assembly being taken apart.



Marion had removed 28 standard gaskets, replacing them with Form-A-Gasket No. 2; fuel pump and rear end gaskets were retained. "Form-A-Gasket No. 2 held perfectly throughout the whole run," Marion said on reporting at the Permatex factory, Sheepscott Bay, N. Y., recently.

## Ford Starts New Power House Equipment at the Rouge Plant

Spinning a Ford V-8 steering wheel, Henry Ford started the steam flowing through a new turbine generator that makes the giant power house of the Rouge plant the largest high pressure steam generating installation in the world.

# Exide

# AUTOMATIC

for  
**CHEVROLETS-PLYMOUTHS**

Select the Exide Best Suited to Your Needs

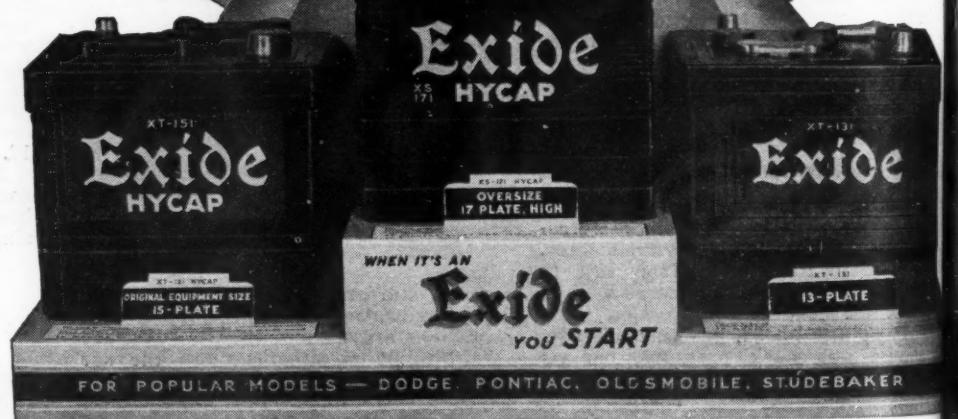
**COMPARISON CHART**

Based on S.A.E. Standard Tests

EXIDE BATTERIES	CRANKING ABILITY	LIFE	PRICE
Original Equipment Size 13-Plate HYCAP	100%	100%	\$9.95
Oversize 17-Plate HYCAP	115%	146%	\$13.45
13-Plate	71%	68%	\$7.25

13-Plate Original Equipment Batteries (Darker than 13-plate standard, 13-plate high)

It attracts  
 It displays  
 It SELLS!



- ★ It displays side by side the batteries that fit a particular car.
- ★ Shows the original equipment size.
- ★ Prices the batteries.
- ★ Describes the service for which each battery is built, enabling the customer to make a sensible choice.
- ★ Compares them on the basis of cranking ability, life and price.
- ★ Shows by direct comparison the greater values in the better grades of Exides.

# EXIDE VENDOR

The Exide Automatic Vendor  
boils down the complete story on Exide  
Batteries to three compelling facts:



CRANKING  
ABILITY

•  
LIFE  
•  
PRICE  
•

**FREE!** For a limited time, Exide Automatic Vendors will be given free with the purchase, at new low prices, of the batteries they display. 86% of the car market is covered by these batteries.

The Vendor is a complete selling unit—all you have to do is ring up the sale on your cash register. No hand-book—no price sheet—no replacement chart needed.

All information is on the Vendor, enabling customers to read, understand and buy—automatically. Nothing like it has ever been known to the battery dealer before.

Your Exide Wholesaler has these free Vendors now. See him or write us—today!

THE ELECTRIC STORAGE BATTERY CO., Philadelphia  
The World's Largest Manufacturers of Storage Batteries for Every Purpose  
Exide Batteries of Canada, Limited, Toronto

## Contest Board Ends 'Drought' For Indianapolis Contestants

The gasoline "drought" has been lifted from the International 500-mile Sweepstakes on the Indianapolis Speedway and in its place is an order for stock fuel such as purchased by the motoring public at the "corner service station."

Elimination of the gasoline restriction which has been in effect at Indianapolis since 1934 was recommended at the annual meeting of the Indianapolis Rules Committee at Detroit on June 26, and was recently ruled by the Contest Board of the American Automobile Association to be written into the supplementary regulations governing the 1937 classic on May 30.

Of the Committee's recommendations, the Contest Board also accepted the minimum qualifying speed of 105 miles per hour, to replace the 100-mile-per-hour minimum in effect for this year's "500"; also, Diesel engined cars will be allowed their same 5-mile-an-hour handicap in computing qualifying speeds, but this advantage will be allowed only for the five fastest Diesels, instead of no "stop clause."

While the gasoline limit, which has been a source of much contention within the racing fraternity since its introduction two years ago, has been discarded, the important economy battle in behalf of the motoring public is not surrendered. The Indianapolis Motor Speedway has already announced a special prize of \$2,500 for the drivers showing the greatest gasoline economy during the race. It is planned, according to official advice, to increase this award before race day.

The gasoline limit in 1934, the first year of the restriction, was 45 gallons, in 1935 it was 42½ gallons, and this year the maximum consumption was placed at 37½ gallons.

## Ross Steering Gear

(Continued from page 31)

there will be a barely perceptible drag when the steering wheel is turned through its center position.

The next step is to adjust for proper mesh of the lever shaft pins (8) in the grooves of the cam (11). Backlash at this point will show up as end play in the lever shaft, which can be determined by grasping the pitman arm near its hub and attempting to move the shaft in and out of the housing. It will also show up as lost motion in the steering wheel. Tighten the adjusting screw (10) until a very slight drag is felt through the mid-position when turning the steering wheel from extreme right to extreme left. The gear must not bind in any position. Only a very slight drag should be felt. A closer adjustment will not correct any steering troubles, and will damage the cam and pins. Tighten the lock nut (9), and recheck to be sure that the pins have the proper mesh.

The grooves of the cam are purposely cut shallower in the straight ahead driving position of each pin, which permits a close adjustment for normal straight ahead driving and also permits take-up of backlash at



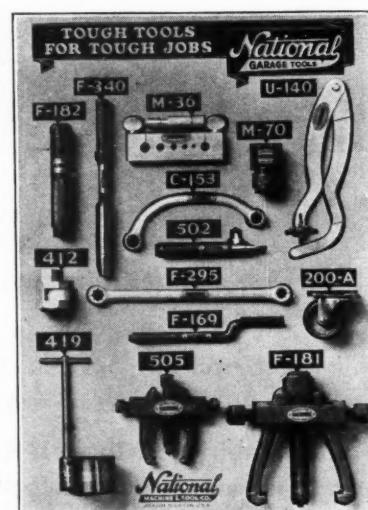
CHICAGO'S compulsory inspection law is now in effect. At this Grant Park lane, about 60 per cent of all comers are found wanting in some respect

this point, after normal wear, without causing a bind elsewhere.

After completing the adjustment, check the center position again by turning the steering wheel from one extreme to the other, counting the number of turns. Then turn the wheel back one-half the number of turns, which will be the center position. It should then be possible to connect the drag link to the pitman arm without having to move the steering gear, and with the front wheels in a straight ahead position. If it is not, remove the pitman arm from the shaft and change its position on the splines so that the drag link can be connected without changing the position of the front wheels.

## New National Display Board

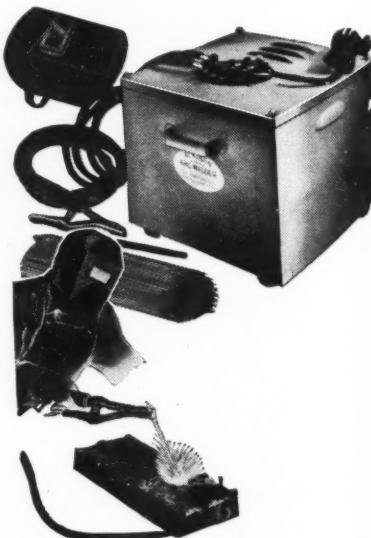
The National Machine & Tool Co., Jackson, Michigan, has announced a new display board that is being supplied free to jobbers with a purchase of the tools shown on it. The board



is described as being constructed of sheet metal and finished in canary yellow. The number of each tool is painted in red above the silhouetted position of each tool on the board.

## Low Priced Welding Outfit Offered by Commonwealth

An arc welder that retails for \$29.50 plus a few dollars for the accessories has been announced by The



Commonwealth Mfg. Corp., Cincinnati, Ohio. It is claimed that this machine will handle all kinds of welding jobs from motor blocks and heavy castings to fenders and light sheet metal. Operates from 110 volt or 220 volt socket.

## Souvenir for AC Plant Visitors

Four thousand persons, many of them members of employees' families, visited operations of the AC Spark Plug division of General Motors in Flint upon the occasion of the company's third annual Visitors' Day. A profusely illustrated souvenir booklet for the visitors entitled "A Visit to the AC Factories," contained a message from the company's president and general manager, Fred S. Kimmerling, inviting written comments of the guests on their trip through the plant.

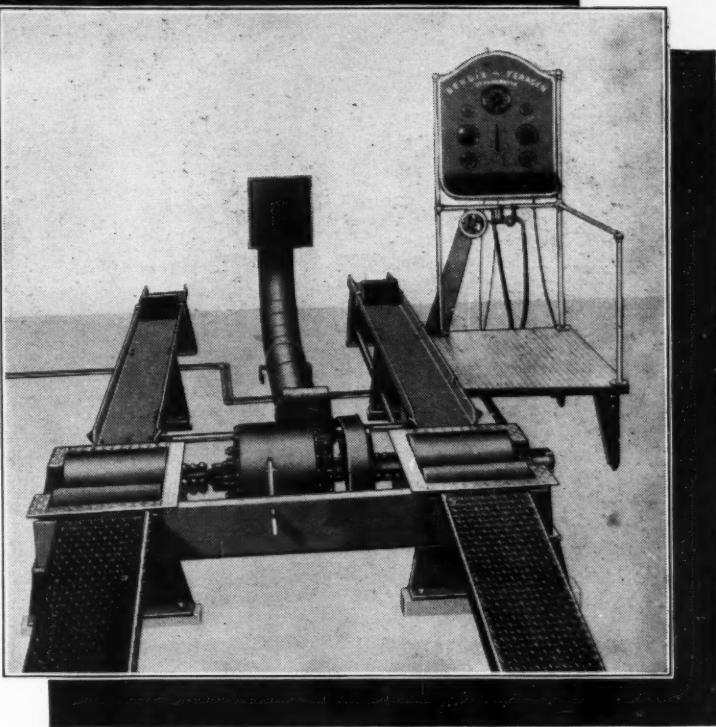
# An "Indoor Proving Ground" that will positively pull business and hold it!

## ENGINE TESTS

Noises, Compression, H.P. at any speed, Vacuum, Gasoline Mileage, Fuel Pump Pressure, Carburetor Efficiency, Exhaust line back pressure, Valve Clearance, Timing, Cooling System.

## CHASSIS TESTS

Noises, Rear Wheel Bearings, Rear Wheel Wobble, Bent Axles, Transmission, Differential, Universal, Propeller Shaft vibration, Clutch, Speedometer calibrations.



When you can prove, beyond a doubt, the definite need for motor and chassis work, and then, after the work is done, prove that it's been well done, you can get business and plenty of it!

The new Bendix-Feragen Chassis Dynamometer will enable you to do exactly that. Designed and built by Bendix, to Bendix standards of accuracy. Moderate in price, simple, thorough. Eliminates all hazardous (and often costly) road tests. Eliminates guessing. Makes top-efficiency motor tune-up quick and easy. Makes the scientifically accurate tests, listed above, on your own service floor.

Built in four sizes, from 30,000 pounds rear axle capacity—horsepower resistance and top speed practically unlimited—to 2,000-pound axle capacity, 100 horsepower. Models for either pit or floor mounting. Usable wherever water connection is available, water being employed as the resistance medium. **SOLD ON EASY TERMS!** No down payment required of responsible buyers. Write for full details NOW! Use the coupon.

**BENDIX PRODUCTS CORPORATION**  
(Subsidiary of Bendix Aviation Corporation)  
401 Bendix Drive, Dept. 11, South Bend, Indiana

## NEW BENDIX - FERAGEN CHASSIS DYNAMOMETER

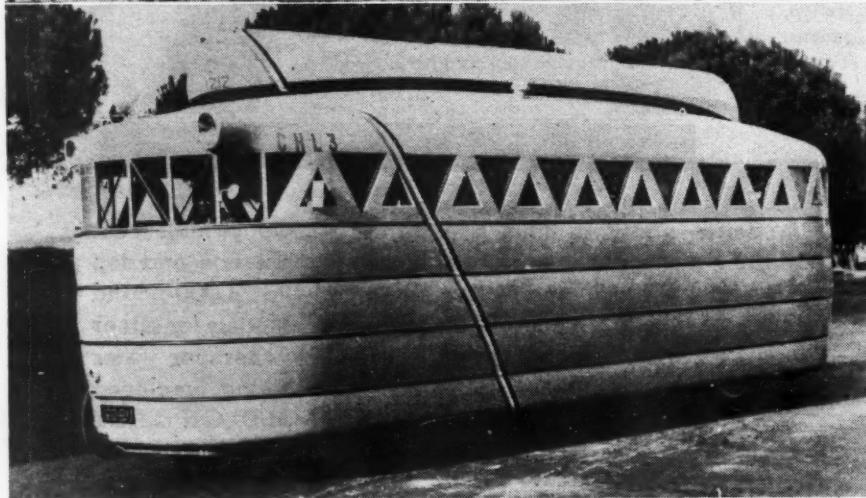
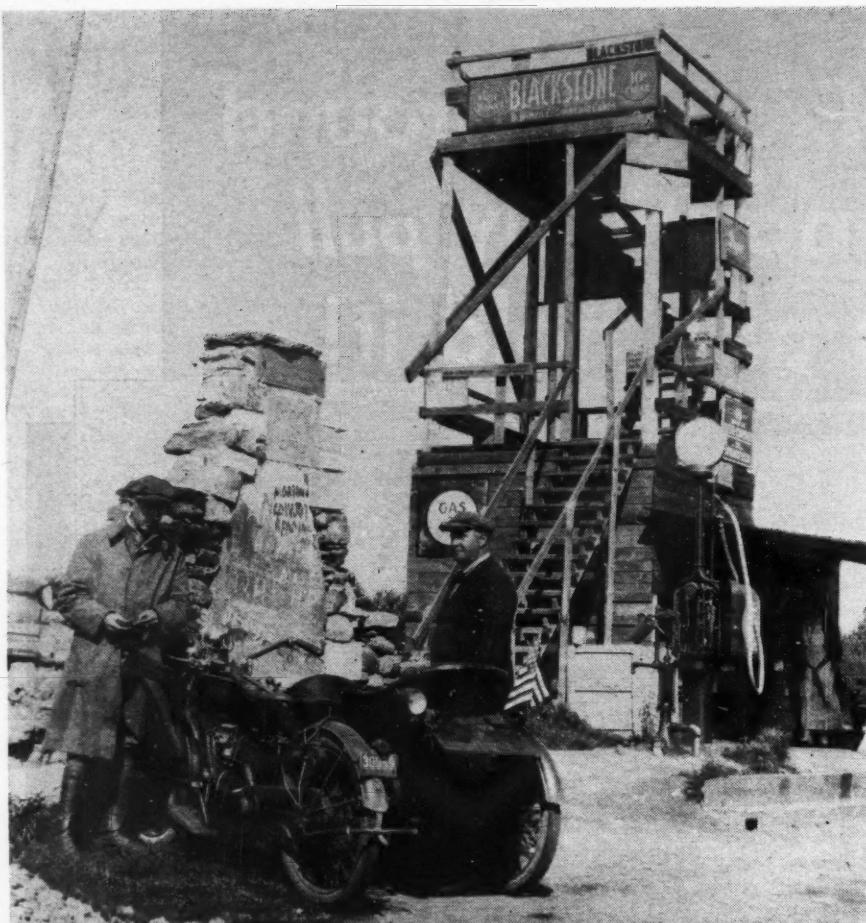
BENDIX PRODUCTS CORPORATION, 401 Bendix Drive, Dept. 11, South Bend, Ind.  
Send me full details regarding the new Bendix-Feragen Chassis Dynamometer.

Name.....

City..... State.....

Street Address.....

Nature of Business.....



FREE view! (Top) This gas station includes among its other "free" services, an observation tower from which tourists may view the country side. (Above) A home on wheels designed by a French inventor. Accommodates four persons inside it. Mounted on a light truck chassis. Has a canoe on its roof.

### Householder Sets New Midget Record at Philadelphia

Ronny Householder, Los Angeles, Calif., gave midget racing fans a real thrill when he drove his "watch charm" racer to victory at the Municipal Stadium, Philadelphia, July 21. Householder not only led the field, but also set a new course record for the dirt oval of 7 minutes, 4 7/10 seconds. Ralph Hankinson, racing promoter in the East, is sponsoring the midget races every Tuesday night at the Philadelphia stadium.

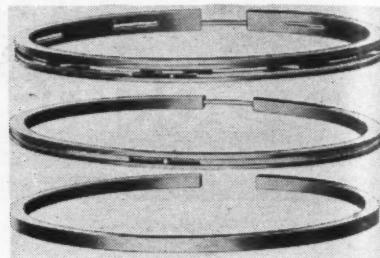
### "Panorama of Power"

Bringing together a complete exposition of power developments and resources in the United States, a "Panorama of Power" will be assembled in Washington in connection with the Third World Power Conference to be held September 7-12.

The Panorama of Power Exposition will present the story of the development of America's vast power resources during the past 50 years, and will picture the machinery which supplies electric energy to one hundred million people.

### Hi-Co Piston Rings Use New Principle of Design

The Hi-Lo Corporation, Chicago, Ill., has announced new compression and oil control piston rings that are said to be the first piston rings made on the principle of self-expansion. They are described as having a steel-



alloy center segment fitted into a groove in the ring. This center segment is free floating, and expands separately from the ring itself, insuring a tight compression seal regardless of the shape of the cylinder. The floating oil wiper segment in the oil control ring is said to trap the oil above the oil vents, keeping the vents free of carbon, providing proper oil control. These piston rings are said to be heat treated by a special process.

### Lantz-Phelps Has New Electric Circuit Tester

A new electrical circuit tester has been announced by The Lantz-Phelps Corp., Dayton, Ohio. It is described as being equipped with a super-sensitive neon glo light in the center which flashes at the point of weak-



ness when full voltage is injected into the system. It is said to test condensers, rotor, breaker points, coil, or any part in the ignition, lighting and starting system and generator.

### Pew and Hall to Represent API at Power Conference

J. Edgar Pew of the Sun Oil Co., Philadelphia, and Edwin S. Hall of the Standard Oil Co. of N. J., New York, have been named as delegates from the American Petroleum Institute to the Third World Power (Fuel) Conference, to be held at Washington, D. C., Sept. 7 to 12.

ign  
ago,  
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are  
made  
sion.  
feel-

WHAT'LL IT BE?

# DOLLARS OR DIRGES!



YOU'VE just sold another brand new automobile.

This car's owner can shoot you in a lot of new customers, or steer a bunch of likely prospects to the dealer down the street.

It all depends on how he reacts to his brand new car in the first thousand miles. Whether you rake in dollars or sing dirges depends upon whether the people you've sold begin to cheer or crab.

*To get an owner off to a singing start, many dealers do two things.*

*First, fill the crankcase with Gulfpride oil. This phenomenal oil can do more to eliminate annoying mechanical troubles than any other oil that ever went into a crankcase! It's 100% Pure Pennsylvania, refined by the world's most advanced refining process—Gulf's exclusive Alchlor process. Gulfpride forms only one-fifth as much carbon as many of the most widely used motor oils.*

*Second, load the tank with Gulf No-Nox Ethyl, Aviation Grade Gasoline. This marvelous fuel quickens acceleration, spurs a fast car to even greater feats of speed, unleashes every ounce of power there is beneath the hood.*

Mail the coupon and get the complete Gulf story—also a FREE copy of a brand-new book, "You Can't Call It Luck!" It tells why you make more profit with Gulf.



MAIL THIS COUPON NOW!

Each Sunday evening, Gulf's radio program salutes a different motor car and its dealers. Columbia Network, 7:30 E. D. S. T.



GULF, 3800 Gulf Building, Pittsburgh, Pa. MA-86

Please send me a FREE copy of your new book for dealers, "You Can't Call It Luck!"

Name \_\_\_\_\_

Street \_\_\_\_\_

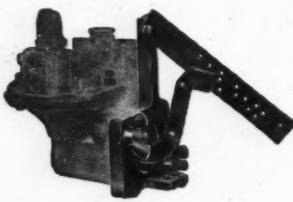
City \_\_\_\_\_ State \_\_\_\_\_



THE AUTOMOTIVE INDUSTRY CALLS IT AN ENDURANCE TEST, but bike riders call it "love." Six days of continuous ring-around-a-rosy on an automobile race track or proving ground might prove something, but the six-day bicycle boys step on it for the fun (and the purse) they get out of it.

### Gage for Checking Fuel Pump Rocker Arms

Hygrade Products Co., New York City, has introduced a gage for checking worn or bent fuel pump rocker arms. Instructions accompanying the gage give correct positions for arms, making this alignment check a simple operation.



### Chevrolet to Hold Soap Box Derby at Akron August 16

Soap box derby champions from 115 American cities will compete in the All-American Soap Box Derby in Akron, Ohio, Aug. 16, while champions from several foreign cities will augment their number for the running of the first International Soap Box Derby on the same day. Sponsored by the Chevrolet Motor Co. in cooperation with more than 115 newspapers, the soap box derby has become one of the greatest juvenile and amateur sporting events in the world. Last year more than 200,000 spectators lined the steep Tallmadge Hill in Akron to see the juvenile racers guide their home-made, powered-by-gravity speeders across the finish line.

Prizes for the winners in the various events in the American and International derbies will range from Chev-



rolet sedans down to watches and medals. All contestants will be provided with special Chevrolet metal racing helmets. Chevrolet officials will supervise the main events in Akron and entertain the winners at a banquet where the prizes will be awarded. In all probability radio networks will carry running descriptions of the Akron races.

### Willys Asks Court Approval On New Model Plans

Signalling marked progress in its plans for permanent reorganization of the Willys-Overland Co., attorneys of the firm have filed in Federal District Court, last week, an application for permission to spend \$400,000 on machinery for the manufacture of a new

model, to be lengthened in wheelbase, widened to standard tread, and to be priced under \$500, according to reports. The firm is now operating under Section 77-B of the National Bankruptcy Act, but is expected to reorganize.

Production of the current line of cars will continue until the present court order for 15,000 cars has been exhausted. The factory is now about midway in production under the order and expects to complete its run some time the latter part of August. About 66,000 cars have been produced under the Federal receivership and reorganization proceedings, bringing dollar volume for the business up to the 29-million mark since receivership was imposed Feb. 15, 1933. The new models will probably be ready for the fall automobile shows, it was said.

### Eveready Prestone Tester

Made for testing Eveready Prestone anti-freeze only, the new Eveready Tester is designed to give a high degree of accuracy and readability. It is described as having an all-glass float and an extra long nozzle to reach the solution in new model cars which have the radiator filler under the hood. The protection table is on a movable cylinder on the outside of the float barrel. Solution never touches the thermometer scale, so there is no chance of its becoming clouded. The Eveready Prestone Tester and a complete kit of selling helps is free to all dealers ordering 24 gallons or more of Eveready Prestone for delivery from the distributor before Oct. 15. National Carbon Co., New York City.



### New L & H Clip-Type Wheel Balance Weight

Harley C. Loney Co., Detroit, Mich., has just announced a new wheel balance weight which clips to the rim



of the wheel. It is claimed that these new weights can be installed or readjusted without deflating the tire, and can be removed by inserting a tool in a hole provided on the outside of the weight. Installed by pressing the clip over the edge of the rim and tapping gently.

# SPRING lubrication

## "MUSTS" FOR A PERFECT SPRING LUBRICANT

1. Penetrate into tight fitting parts.
2. Withstand heavy pressures.
3. Permanently eliminate squeaks.

Ungraphited oils of necessity sacrifice one or more of these qualities. Even spray oils containing powdered graphite have definite limitations due to the large graphite particles. + *Colloidal* graphite, however, is ideally suited for use in such oils. Its minute particle size guarantees quick penetration; its well known ability to lubricate, while withstanding heavy pressures, assures longer periods of squeak-free driving. + Lubrication merchandisers are taking advantage of the sales possibilities of lubricants containing "dag" colloidal graphite. The fresh, convincing selling points plus performance give a fine opportunity for building permanent sales and goodwill. + *Ask your oil supplier about his colloidal-graphited brands today.*

*Send for specially prepared pamphlet*

ACHESON COLLOIDS CORPORATION • PORT HURON, MICHIGAN

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dag  
REG. U. S. PAT. OFF.  
COLLOIDAL PRODUCTS

# COLLOIDAL GRAPHITE

## Repairman's Visit To The

# FACTORIES

Herbert L. Sharlock, for many years associated with Vincent Bendix and Bendix enterprises, has been elected vice-president, director of publicity of the Bendix Products Corp.

\* \* \*

Julian C. Gonzalez has been elected secretary of the Ethyl Gasoline Corp. to succeed the late Arthur E. Mittnacht. Mr. Gonzalez has served as field representative with Ethyl and is now with the manufacturing division.

\* \* \*

E. M. Schultheis has resigned his position with the Detroit office of the Automotive Division of the Timken Roller Bearing Company to join the staff of the Clark Equipment Company of Buchanan, Michigan.

\* \* \*

Commercial Credit Co. has announced the appointment of Frank Haske, former Special Assistant to the Director of the Industrial Division, F. H. A., as Industrial Advisor to the automotive equipment industry.

\* \* \*

Production has started at the new Spanish-style plant opened recently by the Bear Manufacturing Co., for the development and manufacture of its safety inspection products.

\* \* \*

Alexander Milburn Co. of Baltimore, Md., has issued a booklet entitled "A Horrible Example of Pooling of Patents," a reproduction of data furnished to the committee on Patents of the House of Representatives. "This booklet," the company states, "points out the methods employed by a corporation to pool patents to the decided disadvantage of the small inventor and manufacturer."

\* \* \*

Rogers Products Co., Inc. of Jersey City, has announced the appointment of two representatives, "Red" Williams in Atlanta and J. W. Neil of Richmond.

\* \* \*

The Packard Electric Corp., Warren, Ohio, makers of automotive cable, have started construction of a modern one-story factory building which will cost in excess of \$200,000, a factory report says. The new building provides an increase of 50 per cent in actual manufacturing floor space.

\* \* \*

AC Spark Plug division of General Motors reports June sales of spark plugs for replacement use highest in the company's 28 years history.

\* \* \*

L. J. Shields, president of the National Battery Co., St. Paul, Minn.,

has announced that sales volume figures for the year ending April 30, 1936, were the largest in the history of the company, exceeding by 200,000 units the total of any previous year. Total volume was more than 1,750,000 units.

\* \* \*

Wilder Gutterson, for the last 10 years sales manager of the automotive division of the American Cable Co., has joined Ryerson & Haynes, Inc., Jackson, Mich., manufacturers of tire covers and jacks. He will have charge of the New York office.

\* \* \*

Blackhawk Mfg. Co., 120 North Broadway, Milwaukee, manufacturer of hydraulic automotive jacks ranging from one to 75 tons, will increase its production area from upwards of 100,000 sq. ft. to more than three times that figure when it transfers its operations to the former plant of the Kempsmith Mfg. Co., at North Forty-fifth and West Rogers Streets, in suburban Milwaukee. Contracts have been let for remodeling and building a small warehousing addition.

\* \* \*

Tom Walker, Raybestos representative, covering parts of Louisiana, Mississippi, Alabama and Florida, has been forced to resign due to ill health. He is resting at his home in Montgomery, Ala., and hopes that he can get back in action by next year.

St. Paul, Minn., officials recently conducted a series of safety inspections using the Bear Brake Tester, Headlight Adjuster and Wheel Alignment Indicator.

\* \* \*

United States Asbestos Division, Manheim, Pa., makers of Grey-Rock products have recently published a series of posters showing the "right" and "wrong" of brakes—contrasting balanced against un-balanced brakes.

### New National Hack Saw

National Machine & Tool Co., Jackson, Mich., has announced a new style



hack saw that is said to be adaptable for use in splitting bushings, cutting gas and oil lines, and in any place in which space is limited. It is said to work in a  $1/8$ -in. hole. Price of frame and one blade, 75 cents.

## Up-to-date Flat Rate Information

### Chevrolet 1936 Models

Opr.	Mfr.	Opr.	Mfr.	Opr.	Mfr.	Opr.	Mfr.
No.	hrs.	No.	hrs.	No.	hrs.	No.	hrs.
A7x	1.2	C12	1.5	L7	1.0	U6x	.3
A7y	.6	C13	.3	L11	N.C.	U7	N.C.
A9x	.3	D2x	.5	M1	2.3	U12	.3
A11	1.0	D6	.5	M4	■B4.8	U13	.3
A13	■B1.0	D7x	1.0	O1	.2	U14	1.5
A14	2.4	D10	.9	O3	■B3.2	U15Z	.5
A16	.3	D11x	1.0	O11	■B3.7	U16	.3
B4	■B1.0	D12	.8	O12	.5	U17x	.5
B8f	■B1.5	D13	.3	O15	■B4.2	U18	2.5
B10	■B1.7	D15	1.5	P3	5.2	U20	.2
B13	■B3.2	D16	.6	P4	1.0	U21	.5
B18y	2.0	F6	1.5	Q1	■B2.0	U23	.5
B19b	1.2	F10	1.8	Q3	■B2.0	U24	.3
B22	1.0	F13	1.5	R4	1.3	V1	2.0
C1	1.6	F15	2.0	R5	5.0	V2	2.3
C2	2.1	G3	■B8.2	S3	.6	V3	1.3
C4x	.3	H5x	■B4.5	S8	1.5	V5	1.5
C5	.2	H5A	.6	S10	.4	W7	.9
C6	.2	L1	4.0	U2	.3	X5	1.5
C7x	.4	L4	.1	U6	\$0.30	X10	20.0

#### ABBREVIATIONS—

- A13 Includes adjust all steering rod connections
- B4 Includes adjust hand brake
- B8f, B10, B13 Applies to installation of lined shoe assemblies
- G3 Includes tune engine but does not include align rods

■H5x Includes tune engine

■M4 Applies to renewal of cam-shaft gear only

■O3, O11, O15 Applies to Master models only. Add .5 hours for Standard models

■Q1, Q3 See note O3  
N.C. No Charge

## Harry Miller, Racing Car Designer, Joins American Bantam Executive Staff

Harry A. Miller, designer of the famous Miller Special racing motors, and Thomas L. Hibbard, body designer, have joined forces to produce small commercial and passenger cars selling in the \$300 price class, to be known as the American Bantam, according to a recent announcement.

Both men are vice-presidents of the newly organized American Bantam Car Company, Butler, Pa., of which R. S. Evans of Atlanta, Ga., is president. The general offices and plant are located entirely in Butler.

Although the company will feature the production of a quarter-ton delivery truck, a line of passenger cars and a sport speedster also will be exhibited at auto shows this fall.

The company purchased the plant

of the American Austin Car Company last fall. It has 14 acres under roof and has equipped the plant for the complete manufacture of engines, chassis and bodies. A continuous daylight assembly line has been set up under one roof.

Peter Beasley, secretary of the company, also is president of the Detroit Aircraft Company. Martin Tow is treasurer and chairman of the board of directors.

Evans, Miller, Hibbard, Tow and Beasley constitute the board of directors, with the addition of Gilbert W. Klinck of Buffalo, N. Y., president of the Gilbert W. Klinck Brewery Company and a former distributor of autos in western New York State and northern Pennsylvania.

## Wellman Succeeds Moore As NSPA Publicity Man



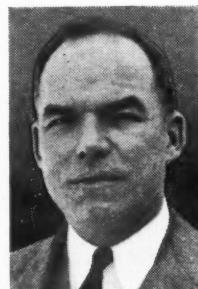
B. S. Wellman

Moore resigned to join the editorial staff of *Jobber Topics*.

Wellman is a graduate of Denison University and prior to his connection with McDaniel, Fisher and Spellman, Akron advertising agency, was advertising and sales promotion manager of Simmons Manufacturing Company, Cleveland.

## Dumas Joins Packard

Paul Dumas, formerly editor of the Chilton Book Department and more recently of the Standard Service Manual, is now associated with the service department of the Packard Motor Car Co. Mr. Dumas' duties will include the preparation of Packard service data and manuals.



## "Full Power-Maximum Mileage"

Standard Oil Co. of Indiana has issued a booklet containing the "factors which affect gasoline mileage." The title of the booklet is "Full Power-Maximum Mileage."

## "Adda-Drawer" Cabinet Made By Imperial Brass

Imperial Brass Mfg. Co., Chicago, Ill., has introduced two new steel cabinets for displaying and merchan-



dising their line of copper tubing, fittings, and flexible tubing. The larger cabinet is said to contain measuring and cutting equipment, making the handling of tubing easier. The smaller cabinet, illustrated, contains five drawers for holding assortments of fittings of all types. It is known as the "Adda-Drawer" cabinet.

## Raybestos Service Guide

Raybestos has introduced a new Brake Service Guide which is full of valuable information clearly presented for the service man. It is being distributed free through Raybestos jobbers to all accounts under contract, but is available to others at the nominal charge of twenty-five cents.

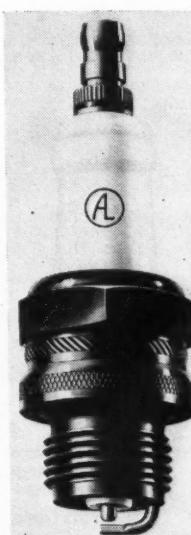
## Ford 3,000,000th Truck

The 3,000,000th truck built by the Ford Motor Company came off the assembly line at the Rouge plant, recently. This V-8 1 1/2-ton panel truck marked the manufacture by Ford of more than one-third of all the trucks turned out by the automobile industry.

## Auto-Lite to Market New Spark Plug

The Electric Auto-Lite Company, of Toledo, has begun the manufacture of spark plugs.

Royce G. Martin, President of Auto-Lite, in making the announcement, points out that inauguration of actual manufacturing operations is not only the logical result of the company's 25 years of research, development and manufacture of every other ignition system unit, of which the spark plug is an integral part, but climaxes several years of special spark plug research, originally begun with the definite idea of



some day creating a plug entirely new in design and efficiency.

"New materials and new alloys," says L. H. Middleton, chief engineer, "have been developed by Auto-Lite. Konium, for instance, is a new electrode, and ziramic is a new insulator material that marks a definite advance. Its formula was developed by Auto-Lite."

The new plant, especially equipped for spark plug production, is described as the finest of all Auto-Lite's many manufacturing units throughout the country.

It is disclosed by the company's engineers that the new type plugs have been undergoing tests in actual operation in various makes of automobiles and trucks for the last two years.

The plugs are being manufactured as fast as the company can turn them out, and a world-wide merchandising organization has been completed. The plugs will soon be available through Auto-Lite's thousands of official service stations, repair shops, garages and other retail outlets.

# Mechanical Specifications

These Specifications Are Brought Up-to-Date Each Month by the

Line Number	MAKE AND MODEL	ENGINE										CHASSIS															
		Lowest Priced 4-door Sedan	Wheelbase (In.)	Tire Size (In.)	No. of Cylinders, Bore and Stroke	Taxible H.P.	Piston Displacement (Cu. In.)	Maximum Brake H.P. at Specified R.P.M.	Compression Ratio (e.i.-1)	Displacement Factor $\dagger$	Cylinder Head Material	Camshaft Drive Make	Piston Material	Oil Cleaner Make	Air Cleaner Make	Carburetor Make	Muffler Make	Electrical System Make	Battery Make	Clutch	Gearset Make	Universal Type and Make	Rear Axle Type and Make	Service Brake Type and Make	Steering Gear Make		
1	Auburn.....	654	\$ 795	120	6.00/16	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	22.5	209.9	85-3500	6.20	37.4	Al.	Whit.	Al.	Pur.	AC.	Str.	Buf.	A.	USL.	P.Long.	WG.	Nb-Mec.	2 $\frac{1}{2}$ Col.	BH..		
2	Auburn.....	852	1095	127	6.50/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	30.0	279.9	115-3600	6.50	41.4	Al.	Whit.	Al.	Pur.	AC.	Str.	Buf.	A.	USL.	P.Long.	Det.	Nb-Mec.	2 $\frac{1}{2}$ Col.	BH..		
3	Auburn.....	SC852	1545	127	7.00/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	30.0	279.9	150-4000	6.50	...	Al.	Whit.	Al.	Pur.	AC.	Str.	Buf.	A.	USL.	P.Long.	Det.	Nb-Mec.	2 $\frac{1}{2}$ Col.	BH..		
4	Austin.....		75	3.75/18	4-2.2x3	7.8	45.6	13-3200	5.30	...	Cl.	Spir.	Al.	No.	No.	Til.	Buf.	A.	USL.	P.Rock.	WG.	F-Spi.	2 $\frac{1}{2}$ Sal.	M.m.			
5	Buick.....	36-40	885	118	6.50/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	30.6	233.0	93-3200	5.65	39.6	Cl.	LB.	Ala.	No.	AC.	Str.	Wal.	D.	Del.	P.Own.	Own.	m-Spi.	1 $\frac{1}{2}$ Own.	OH..		
6	Buick.....	36-60	1090	122	7.00/15	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	37.8	320.2	120-3200	5.45	...	Cl.	LB.	Ala.	AC.	AC.	Str.	Wal.	D.	Del.	P.Own.	Own.	m-Spi.	2 $\frac{1}{2}$ Own.	OH..		
7	Buick.....	36-80	125	131	7.00/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	37.8	320.2	120-3200	5.45	40.7	Cl.	LB.	Ala.	AC.	AC.	Str.	Wal.	D.	Del.	P.Own.	Own.	m-Spi.	2 $\frac{1}{2}$ Own.	OH..		
8	Buick.....	36-90	1695	138	7.50/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	37.8	320.2	120-3200	5.45	...	Cl.	LB.	Ala.	AC.	AC.	Str.	Wal.	D.	Del.	P.Own.	Own.	m-Spi.	3 $\frac{1}{2}$ Own.	OH..		
9	Cadillac.....	V8-60	1695	121	7.00/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	36.4	322.0	125-3400	6.25	45.7	Cl.	Mor.	Ala.	No.	AC.	Str.	Old.	D.	Del.	P.Long.	Own.	Nb-Mec.	2 $\frac{1}{2}$ Own.	BH..		
10	Cadillac.....	V8-70 & 75	2445	131-38	7.50/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	39.2	346.0	135-3400	6.25	...	(a) Cl.	Mor.	Ala.	No.	AC.	Str.	Old.	D.	Del.	P.Long.	Own.	Nb-Mec.	2 $\frac{1}{2}$ Own.	BH..		
11	Cadillac.....	V12-80 & 85	3145	131-38	7.50/16	12-3 $\frac{1}{2}$ x4	46.9	368.0	150-3600	6.00	(b) Cl.	Mor.	Ala.	Han.	AC.	DL.	Old.	D.	Del.	P.Own.	Own.	Nb-Mec.	2 $\frac{1}{2}$ Own.	BH..			
12	Cadillac.....	V16-90	7250	154	7.50/17	16-3 $\frac{1}{2}$	57.5	452.0	185-3800	6.00	43.7	Cl.	Mor.	Ala.	Cu.	AC.	DL.	Own.	D.	dp.Own.	Own.	Nb-Mec.	2 $\frac{1}{2}$ Own.	KP..			
13	Chevrolet. Mas. Con.	640	113	5.50/17	6-3 $\frac{1}{2}$ x4	26.3	206.8	79-3200	6.00	35.2	Cl.	Own.	Cl.	No.	AC.	Car.	Own.	D.	D.	P.Own.	Own.	m-Own.	2 $\frac{1}{2}$ Own.	OH..			
14	Chevrolet. Mas. Ind.		113	5.50/17	6-3 $\frac{1}{2}$ x4	26.3	206.8	79-3200	6.00	34.6	Cl.	Own.	Cl.	No.	AC.	Car.	Own.	D.	D.	P.Own.	Own.	m-Own.	2 $\frac{1}{2}$ Own.	OH..			
15	Chevrolet.....	Std.	575	109	5.25/17	6-3 $\frac{1}{2}$ x4	26.3	206.8	79-3200	6.00	39.5	Cl.	Own.	Cl.	No.	AC.	Car.	Own.	D.	D.	P.Own.	Own.	m-Own.	2 $\frac{1}{2}$ Own.	OH..		
16	Chrysler.....	Six	875	118	6.25/16	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	27.3	241.5	93-3400	6.00	41.5	Cl.	Ch.	Ala.	Pur.	Bur.	Car.	NS.	A.	Wil.	P.B&B.	Own.	Nb-UP.	2 $\frac{1}{2}$ Own.	LH..		
17	Chrysler.....	DeLuxe 8	1045	121	6.50/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	33.8	273.8	105-3400	6.20	43.3	Cl.	Ch.	Ala.	Pur.	AC.	Str.	NS.	A.	Wil.	P.B&B.	Own.	Nb-UP.	2 $\frac{1}{2}$ Own.	LH..		
18	Chrysler.....	Airflow 8	1345	123	7.00/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	33.8	323.5	115-3400	6.20	41.8	Cl.	Ch.	Ala.	Pur.	AC.	Str.	Bur.	A.	Wil.	P.B&B.	Own.	Nb-UP.	2 $\frac{1}{2}$ Own.	LH..		
19	Chrysler.....	Air. Imp. 8	1475	128	7.50/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	33.8	323.5	130-3600	6.50	42.4	Cl.	Ch.	Ala.	Pur.	AC.	Str.	Bur.	A.	Wil.	P.B&B.	Otgw.	Nb-UP.	2 $\frac{1}{2}$ Own.	LH..		
20	Chrysler. Af. Cus. Imp. 8		137	125	7.00/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	33.8	323.5	130-3600	6.50	...	Cl.	Ch.	Ala.	Pur.	AC.	Str.	Bur.	A.	Wil.	P.B&B.	Otgw.	Nb-UP.	2 $\frac{1}{2}$ Own.	LH..		
21	Cord.....	810	1995	125	6.50/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	28.8	266.5	125-3500	6.50	...	Al.	Whit.	Al.	No.	AC.	Str.	Buf.	A.	USL.	P.Long.	Own.	...	Tu	LH..		
22	De Soto. Airstream 6	810	118	6.25/16	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	27.3	241.5	93-3400	6.00	41.5	Cl.	Ch.	Ala.	Pur.	Bur.	Car.	NS.	A.	Wil.	P.B&B.	Own.	Nb-UP.	2 $\frac{1}{2}$ Own.	LH..			
23	De Soto.....	Airflow 6	1095	115 $\frac{1}{2}$	6.50/16	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	27.3	241.5	100-3400	6.50	35.6	Al.	Ch.	Ala.	Pur.	AC.	Car.	NS.	A.	Wil.	P.B&B.	Own.	Nb-UP.	2 $\frac{1}{2}$ Own.	LH..		
24	Dodge.....	Six	735	116	6.00/16	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	25.3	217.8	87-3600	6.50	40.0	Cl.	Ch.	Ala.	Pur.	AC.	Str.	NS.	A.	Wil.	P.B&B.	Own.	Nb-UP.	2 $\frac{1}{2}$ Own.	PH..		
25	Duesenberg.....	J	142-153 $\frac{1}{2}$	700/19 $\frac{1}{2}$	6.00/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	45.0	419.7	320-4200	5.20	...	Cl.	LB.	Al.	Pur.	Y.	Str.	D.	Exi.	pd.Long.	Own.	m-Spi.	2 $\frac{1}{2}$ Own.	PH..			
26	Ford.....	V8	580	112	6.00/16	8-3 $\frac{1}{2}$ x3 $\frac{1}{2}$	30.0	221.0	85-3800	6.30	41.2	Al.	Gear.	Al.	No.	Yes.	Str.	Own.	O.	P.Os.	Own.	m-Own.	2 $\frac{1}{2}$ Own.	OM..			
27	Graham.....	6-80	665	111	6.00/16	6-3 $\frac{1}{2}$	21.6	169.6	70-3500	6.80	37.1	Al.	LB.	Als.	No.	AC.	Mar.	Old.	D.	Wil.	P.III.	WG.	Nb-Spi.	2 $\frac{1}{2}$ Own.	OH..		
28	Graham.....	6-80A	625	111	5.25/17	6-3 $\frac{1}{2}$	21.6	169.6	70-3500	6.80	...	Al.	LB.	Als.	No.	AC.	Mar.	Old.	D.	Wil.	P.III.	WG.	Nb-Spi.	2 $\frac{1}{2}$ Own.	OH..		
29	Graham.....	6-90	795	115	6.00/16	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	25.3	217.8	85-3300	6.70	39.7	Al.	LB.	Als.	No.	AC.	Mar.	Old.	D.	Wil.	P.III.	WG.	Nb-Spi.	2 $\frac{1}{2}$ Own.	OH..		
30	Graham.....	6-90A	745	115	6.00/16	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	25.3	199.1	80-3300	6.70	44.2	Al.	LB.	Als.	No.	AC.	Mar.	Old.	D.	Wil.	P.III.	WG.	Nb-Spi.	2 $\frac{1}{2}$ Own.	OH..		
31	Graham. S. C. 6, 110	895	115	6.25/16	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	25.3	217.8	112-4000	6.70	...	Al.	LB.	Als.	Fram.	AC.	Mar(s).	Old.	D.	Wil.	P.III.	WG.	Nb-Spi.	2 $\frac{1}{2}$ Own.	OH..			
32	Hudson.....	6-63	785	120	6.00/16	6-3 $\frac{1}{2}$ x5	21.6	212.0	93-3800	6.25	39.3	Cl.	Ge <sup>o</sup> .	Al.	No.	AC.	Car.	Old.	A.	Nat.	P.Ownf.	Own.	Nb-Spi.	2 $\frac{1}{2}$ Own.	BH..		
33	Hudson. 8, 64-5-6-7	830	120-127	6.25/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	28.8	254.0	113-3600	6.00	40.0	Cl.	Ge <sup>o</sup> .	Al.	No.	AC.	Car.	Old.	A.	Nat.	P.Ownf.	Own.	Nb-Spi.	2 $\frac{1}{2}$ Own.	BH..			
34	Hupmobile.....	618-G	855	118	6.00/16	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	29.4	245.3	101-3600	5.75	45.4	Cl.	Mor.	Als.	No.	Bur.	Car.	Old.	A.	Wil.	P.B&B.	WG.	Nb-Spi.	2 $\frac{1}{2}$ Own.	LH..		
35	Hupmobile.....	621-N	1035	121	6.50/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	32.5	303.2	120-3500	5.80	47.3	Cl.	Mor.	Als.	No.	Bur.	Car.	Old.	A.	Wil.	P.Long.	WG.	Nb-UP.	2 $\frac{1}{2}$ Own.	LH..		
36	Lafayette.....	3610	675	113	6.00/16	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	25.3	217.7	83-3200	5.61	39.4	Cl.	Whit.	Als.	No.	AC.	Str.	Old.	D.	Str.	A.	USL.	P.B&B.	Own.	Nb-UP.	2 $\frac{1}{2}$ Own.	BH..
37	La Salle.....	36-50	1185	120	7.00/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	28.8	248.0	105-3600	6.25	39.0	Cl.	Whit.	Al.	No.	AC.	Str.	Old.	D.	Str.	P.B&B.	Own.	Nb-Mec.	2 $\frac{1}{2}$ Own.	BH..		
38	Lincoln.....	Zephyr	1275	122	7.00/16	12-3 $\frac{1}{2}$ x3 $\frac{1}{2}$	36.3	267.3	110-3900	6.7	42.5	Al.	Gear.	St.	Yes.	Str.	Own.	O.	Own.	P.Os.	Own.	m-Own.	2 $\frac{1}{2}$ Own.	MO..			
39	Lincoln.....	V12	136-145	7.50/17	12-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	46.8	414.0	150-3400	6.38	41.5	Ala.	Ch.	Ala.	Pur.	Yes.	Str.	Own.	A.	Exi.	P.Long.	Own.	FF Tim.	M..				
40	Nash.....	Ambassador	885	125	6.25/16	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	27.3	234.8	93-3400	5.70	36.8	Cl.	Whit.	Als.	Own.	AC.	Str.	Old.	D.	Str.	A.	USL.	P.B&B.	Own.	Nb-Mec.	2 $\frac{1}{2}$ Own.	BH..
41	Nash. Amb. Super 8	995	125	6.50/16	8-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	31.2	260.8	102-3400	5.25	36.5	Cl.	Ch.	Als.	Own.	AC.	Str.	Old.	D.	Str.	A.	USL.	P.B&B.	Own.	Nb-Mec.	2 $\frac{1}{2}$ Own.	BH..	
42	Nash.....	400	740	117	6.00/16	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	27.3	234.8	90-3400	5.61	42.2	Cl.	Whit.	Als.	No.	AC.	Str.	Old.	D.	Str.	A.	USL.	P.B&B.	Own.	Nb-UP.	2 $\frac{1}{2}$ Own.	BH..
43	Oldsmobile.....	F36	795	115	6.50/16																						

# Tune-Up Specifications

Car Manufacturers and Supersede All Others Previously Published

Steering Gear Make		Compression Pressure at Cranking Speed (Lbs.)		RINGS		VALVES						IGNITION						FRONT AXLE													
						Spark Plug	Make and Type	No. and Width Camper	No. and Width Oil	Piston Pin Locked in	Head Diameter and Seat Angle	Operating Tappet Clearance	Intake Valve Opens Before or After T.C.	Inlet Tappet Clearance for Valve Timing	No. of Degrees	No. of Flywheel Teeth	Breaker Points Gap (Ins.)	Timing	Spark Occurs 'TC	No. of Flyw. Teeth Spark Occurs 'TC	Breaker Housing	Crankpin Length (Ins.)	Capacity Crankcase (Qts.)	Capacity Cooling System (Qts.)	Caster (Degrees)	Camber (Degrees)	Toe-in (Inches)	King Pin Inclination (Degrees)	Line Number		
BH..	R..	Ch-J-6...	2-1/8	1-1/8	1-1/8	1/8	R..	1 1/8	30	1 1/8	45	342	010H	.010H	.012	7 1/2	2 1/4	110	.018	.025	3B..	1B..	Au..	2 1/8	1 1/4	6 16	3 1/2-4	1.5	1/8	7 1/2	1
BH..	R..	Ch-J-6...	2-1/8	1-1/8	1-1/8	1/8	R..	1 1/8	30	1 1/8	45	342	010H	.010H	.012	7 1/2	2 1/4	110	.018	.025	3B..	1B..	Au..	2 1/8	1 1/4	8 20	2-3	1.5	1/8	7 1/2	2
BH..	R..	Ch-J-9...	2-1/8	1-1/8	1-1/8	1/8	R..	1 1/8	30	1 1/8	45	342	010H	.010H	.012	7 1/2	2 1/4	110	.013	.025	3B..	1B..	Au..	2 1/8	1 1/4	8 20	2-3	1.5	1/8	7 1/2	3
M.m.	O..	Ch-C-7...	2-1/8	1-1/8	1-1/8	1/8	R..	1 1/8	30	1 1/8	30	303H	.004H	TC..	TC..	80	.020	TC..	TC..	Re..	1 1/4	4	6	5	1 1/4	1/8-1/2	1 1/2	4			
OH..	S..	AC-H9...	2-1/8	2-1/8	2-1/8	1/8	R..	1 1/8	45	1 1/8	45	371	.015	.015	.019	8B..	3 1/4	146	.015	.025	2B..	1 1/4	A..	2	1 1/8	6 13 1/4	3-3 1/2	1/8-1/2	4	5	
OH..	S..	AC-H9...	2-1/8	2-1/8	2-1/8	1/8	R..	1 1/8	45	1 1/8	45	371	.015	.015	.019	14B..	6B..	156	.015	.025	10B..	4 1/2	A..	2	1 1/8	8 17	1 1/4-2 1/4	1/8-1/2	4	6	
OH..	S..	AC-H9...	2-1/8	2-1/8	2-1/8	1/8	R..	1 1/8	45	1 1/8	45	371	.015	.015	.019	14B..	6B..	156	.015	.025	10B..	4 1/2	A..	2	1 1/8	8 17	1 1/4-2 1/4	1/8-1/2	4	7	
OH..	S..	AC-H9...	2-1/8	2-1/8	2-1/8	1/8	R..	1 1/8	45	1 1/8	45	371	.015	.015	.019	14B..	6B..	156	.015	.025	10B..	4 1/2	A..	2	1 1/8	8 17	1 1/4-2 1/4	1/8-1/2	4	8	
BH..	S..	AC-K9...	2-1/8	2-1/8	2-1/8	1/8	F..	1 87	45	1 62	45	341	AA..	AA..	0	TC..	TC..	156	.015	.026	5B..	..	Ad..	2 46	2 1/2	7 30	1 1/2-2	1/4-1	0-1/8	4 251	9
BH..	S..	AC-K9...	2-1/8	2-1/8	2-1/8	1/8	F..	1 87	45	1 62	45	341	AA..	AA..	0	TC..	TC..	156	.015	.026	5B..	..	Ad..	2 46	2 1/2	7 29	1 1/2-2	0-1/8	0-1/8	5 38	10
BH..	S..	AC-G6...	3-1/2	1-1/8	3-1/2	1/8	P..	1 51	45	1 39	45	341	AA..	AA..	0	TC..	TC..	113	.021	.026	4B..	1 1/4	Ad..	2 24	2 1/2	9 19	1 1/2-2	0-1/8	0-1/8	5 38	11
KP..	S..	AC-G6...	3-1/2	1-1/8	3-1/2	1/8	P..	1 51	45	1 39	45	341	AA..	AA..	0	TC..	TC..	113	.016	.026	4B..	1 1/4	Ad..	2 24	2 1/2	10 24	1 1/2-2	1/8-1/2	4	12	
OH..	O..	112 AC-K11...	2-1/8	1-1/8	99	R..	1 1/8	30	1 1/8	30	1 1/8	006H	.013H	.006	9B..	3 1/4	133	.018	.032	5B..	1 1/4	Ad..	2 1/8	1/2	5 15	3-3 1/2	1/2-1/8	1/8-1/2	13		
OH..	O..	112 AC-K11...	2-1/8	1-1/8	99	R..	1 1/8	30	1 1/8	30	1 1/8	006H	.013H	.006	9B..	3 1/4	133	.018	.032	5B..	1 1/4	Ad..	2 1/8	1/2	5 15	3-3 1/2	1/2-1/8	1/8-1/2	15		
OH..	O..	112 AC-K11...	2-1/8	1-1/8	99	R..	1 1/8	30	1 1/8	30	1 1/8	006H	.013H	.006	9B..	3 1/4	133	.018	.032	5B..	1 1/4	Ad..	2 1/8	1/2	5 15	3-3 1/2	1/2-1/8	1/8-1/2	15		
LH..	G..	Ch-J-8...	2-1/8	2-1/8	2-1/8	1/8	F..	1 1/8	45	1 1/8	45	340	AA..	AA..	0	TC..	TC..	146	.020	.025	TC..	TC..	Au..	2 1/8	1 1/8	6 19	1 1/4	1/2	0-1/8	9 1/2	16
LH..	G..	Ch-J-8...	2-1/8	2-1/8	2-1/8	1/8	F..	1 1/8	45	1 1/8	45	340	AA..	AA..	0	TC..	TC..	146	.018	.025	TC..	TC..	Au..	2 1/8	1 1/8	6 22	1 1/4	1/2	0-1/8	5 1/4	17
LH..	G..	Ch-J-8...	2-1/8	2-1/8	2-1/8	1/8	F..	1 1/8	45	1 1/8	45	340	AA..	AA..	0	TC..	TC..	146	.018	.025	TC..	TC..	Au..	2 1/8	1 1/8	6 17	2	1/2	0-1/8	5	19
LH..	G..	Ch-H-10...	2-1/8	2-1/8	2-1/8	1/8	F..	1 1/8	45	1 1/8	45	340	AA..	AA..	0	TC..	TC..	146	.018	.025	5A..	2A..	Au..	2 1/8	1 1/8	6 17	2	1/2	0-1/8	5	20
LH..	G..	Ch-J-9...	2-1/8	1-1/8	2-1/8	1/8	F..	1 1/8	45	1 1/8	45	342	010H	.010H	.012	7 1/2	3B..	..	..	..	..	..	..	..	..	..	..	..	..	21	
LH..	G..	Ch-J-8...	2-1/8	2-1/8	2-1/8	1/8	F..	1 1/8	45	1 1/8	45	340	006H	.008H	.010	TC..	TC..	146	.020	.025	TC..	TC..	Au..	2 1/8	1 1/8	6 19	1 1/4	1/2	0-1/8	9 1/2	22
LH..	G..	Ch-J-8...	2-1/8	2-1/8	2-1/8	1/8	F..	1 1/8	45	1 1/8	45	340	006H	.008H	.010	TC..	TC..	146	.020	.025	5A..	2A..	Au..	2 1/8	1 1/8	6 19	2	1/2	0-1/8	5	23
LH..	G..	Ch-J-8...	2-1/8	2-1/8	2-1/8	1/8	F..	1 1/8	45	1 1/8	45	340	006H	.008H	.010	TC..	TC..	146	.020	.025	4B..	1 1/4	Au..	2 1/8	1 1/8	5 15	2	1/2	0-1/8	9 1/2	24
PH..	R..	Ch-6M...	3-1/8	1-1/8	1-1/8	1/8	F..	1 1/8	30	1 1/8	30	1 1/8	015	.015	.025	6B..	2B..	119	.021	.025	14B*	..	Ad..	2 1/8	1 1/8	12 32	3	1	1/4	8 1/2	25
OM..	O..	105 Ch-7...	2-1/8	1-1/8	3/4	F..	1 1/8	45	1 1/8	45	1/8	013C	013C	9 1/2	3B..	..	112	.013	.025	4B..	1 1/4	Au..	2	1/8	5 22	7	1/2	0-1/8	8 1/2	26	
OH..	R..	Ch-7...	2-1/8	2-1/8	2-1/8	1/8	R..	1 1/8	30	1 1/8	45	1/8	010H	010H	012	4 1/2	B..	130	.018	.025	2B..	3/4	Au..	1 1/8	5 11	21/2	1	1/8	7 1/2	27	
OH..	R..	Ch-7...	2-1/8	2-1/8	2-1/8	1/8	R..	1 1/8	30	1 1/8	45	1/8	010H	010H	012	4 1/2	B..	130	.018	.025	2B..	3/4	Au..	1 1/8	5 11	21/2	1	1/8	7 1/2	29	
OH..	R..	Ch-J-9...	2-1/8	2-1/8	2-1/8	1/8	R..	1 1/8	30	1 1/8	45	1/8	010H	010H	012	4 1/2	B..	130	.018	.025	2B..	3/4	Au..	1 1/8	5 15	21/2	1	1/8	7 1/2	30	
OH..	R..	Ch-J-9...	2-1/8	2-1/8	2-1/8	1/8	R..	1 1/8	30	1 1/8	45	1/8	010H	010H	012	4 1/2	B..	130	.018	.025	2B..	3/4	Au..	1 1/8	5 15	21/2	1	1/8	7 1/2	31	
BH..	G..	Ch-J-8...	2-1/8	2-1/8	2-1/8	1/8	F..	1 1/8	45	1 1/8	45	340	006H	.008H	.010	TC..	TC..	146	.020	.025	TC..	TC..	Au..	2 1/8	1 1/8	6 19	1 1/4	1/2	0-1/8	9 1/2	32
BH..	G..	Ch-J-8...	2-1/8	2-1/8	2-1/8	1/8	F..	1 1/8	45	1 1/8	45	340	006H	.008H	.010	TC..	TC..	146	.020	.025	TC..	TC..	Au..	2 1/8	1 1/8	6 19	1 1/4	1/2	0-1/8	7 1/2	33
LH..	R..	107 Ch-C-7...	2-1/8	2-1/8	2-1/8	1/8	F..	1 1/8	45	1 1/8	45	340	010	.013	.014	2B..	112	.018	.028	7B..	2 1/4	Ad..	2 1/8	1 1/8	6 18	1 1/4	1/2	0-1/8	7 1/2	34	
LH..	G..	113 Ch-C-7...	2-1/8	2-1/8	2-1/8	1/8	F..	1 1/8	45	1 1/8	45	340	006	.013	.010	1A..	109	.016	.028	7B..	2 1/4	Ad..	2 1/8	1 1/8	8 21	1 1/4	1/2	0-1/8	8 1/2	35	
BH..	G..	100 Ch-7...	2-1/8	1-1/8	7/8	F..	1 1/8	45	1 1/8	45	341	015	.015	.015	5A..	104	.020	.023	10B..	3B..	Au..	2	1/8	7 19	2 1/2	1/2	1/8	7 1/2	36		
BH..	S..	AC-K9...	2-1/8	1-1/8	7/8	P..	1 1/8	45	1 1/8	45	311	031	.004C	.006C	004	21B..	116	.020	.022	7B..	2 1/4	Au..	2	1/8	6 27	7	3/4	1/8-1/2	8 1/4	37	
MO..	O..	105 Ch-J-9...	2-1/8	2-1/8	2-1/8	1/8	P..	1 1/8	45	1 1/8	45	311	031	.004C	.006C	004	21B..	116	.020	.022	7B..	2 1/4	Au..	2	1/8	6 27	7	3/4	1/8-1/2	8 1/4	38
MO..	O..	105 Ch-7...	2-1/8	2-1/8	2-1/8	1/8	P..	1 1/8	45	1 1/8	45	311	031	.004C	.006C																

# Complete Analyzer

FOR ONLY

**\$ 8 00**  
A MONTH  
SMALL DOWN PAYMENT

Monthly Payments Include Insurance—Fire—Theft—  
Lightning—Transportation—Tornado—Cyclone—  
Windstorm—Water Damage—Flood—Rising Water.

SERIES  
1000  
ANALYZER **1937 MODEL**  
NEW FROM STEM TO STERN  
(Not An Old Model Revamped)



## A Message to Those Men Who Are Still Considering Engine Tune-Up Equipment

### HERE IS NEWS FOR YOU:

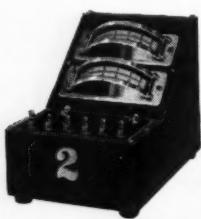
Six car factories are urging 15,000 of their service dealers to buy the Weidenhoff engine analyzer "Series 1000" so they can tie in with the national tune-up programs which are to be released by these factories immediately.

This publicity will make all car owners "tune-up conscious" as never before, and will automatically broaden the market for independent operators as well as car dealers, and, since these activities will center around the "Series 1000" analyzer, it's a safe bet no service operator will go wrong in following the suggestions these car factories are making to their service dealers—"Buy the Weidenhoff Series 1000 Analyzer—it answers all of our technical requirements and the price is right."

If you weigh all the facts carefully you will want to get started without delay. Consult a Weidenhoff jobber immediately.



Tests vacuum, compression, spark plugs, ignition cable. Detects engine miss, etc. Price..... \$37.50



Voltmeter, ammeter, Rheo stats. Tests storage battery, starter, distributor, accessories, wiring, etc. Price..... \$34.75



Coil Tester; tests coil and ignition system under starting, slow, or high speed conditions, etc. Price..... \$48.50



Tests condensers for capacity and power factor. Tests radio suppressors, antennas, resistance of fuel gauge indicators and tank units, etc. Price..... \$24.00



Manometer; tests muffler back-pressure, fuel pump pressure, float valve needle, fuel line, fuel pump suction, air cleaner restriction, etc. Price..... \$25.00

**JOSEPH WEIDENHOFF, INC.**  
4340-58 ROOSEVELT RD. CHICAGO, U. S. A.

## Texas Centennial

(Continued from page 19)

finger tips. Chief Pontiac, the mechanical Indian chief, who answers questions and greets visitors, occupies a seat of honor.

The largest single exhibit building is that of the Ford Motor Company, located on Constitution Place. Fifteen major exhibits are housed in this large, completely air-conditioned hall developing the theme: "Raw Materials From the Soil to Finished Car Parts," used in the manufacture of Ford, Lincoln and Lincoln-Zephyr cars.

Exhibits explain how Ford uses in its 1936 automobile production schedule 89,300,000 pounds of cotton, 3,204,000 pounds of wool, the product of 30,000 acres of soy beans, 782,000 pounds of tung oil, 1,000,000 pounds of lard obtained from some 20,000 hogs and other similar quantities of raw materials.

Displayed on a balcony encircling the lobby of the main building is a Pageant of Transportation which begins with the primitive oxcart and Conestoga wagon, and through progressive stages carries on to the automotive exhibits, which include the Eisenach automobile of 1898-99, made in Germany, and continues on to the 1936 Ford V-8.

Chrysler Motors Hall, occupying the entire east wing of the huge Transportation Building, is a vast expanse of deep-sea-blue plate glass mirrors. Forty-three tons of plate glass reflect the Chrysler, DeSoto, Dodge and Plymouth lines.

Deep in Chrysler Hall, with an entrance from the Mirror Salon and another from the Esplanade of State, is Chrysler's Hall of Celebrities. This is a marionette theatre where Sue Hastings' little wooden people perform for the amusement of Centennial visitors.

Growing increasingly popular is the building with a "voice." It's the Gulf Radio Studios, frequently referred to as "The Voice of the Centennial."

Visitors to the Centennial find the Gulf Studios modern in every respect. The V-shaped studios, constructed of stucco, measure more than 140 feet from tip to tip. The broadcasting rooms are enclosed in glass so that the visitor can watch the performers. Engineers and radio technicians may be observed as they throw switches and turn dials so that the programs will come forth from the loudspeakers exactly as they enter the microphones.

Scattered throughout the grounds are twenty pylons, or "singing towers," over which the events being broadcast may be heard by those wandering along the midway or among the exhibits. The pylons are so wired that six different programs may be broadcast within the Exposition Grounds. This has been done so that the happenings of the day are able to be fitted into the moods and interests of the greatest number of people.

The Nash-Lafayette Safety Driving Exhibit is located in a booth in the Transportation Building. Through pictures it stresses the importance of exercising care in traffic and open highway driving.

## FIRST IN THE FIELD!



*Sensational new*  
**HEIN-WERNER**  
**HYDRAULIC**  
**JACK**  
for  
**FORD**  
**CHEVROLET**  
*and other light trucks*

This ONE new model Hein-Werner Hydraulic Jack will handle all light trucks.

Practically none of the trucks of 2 tons or under being produced, or already on the road, have a hydraulic jack as original equipment —so a great need exists for this jack that is *built right* and *priced right*.

Model 2.95A is tested at 1½ times its rated capacity of 2 tons. Has 7" lift to total height of 16½" . . . List Price \$5.95 . . . Dealer Net Price \$4.15. (West Coast List Price \$6.45, Dealer Price \$4.55).

Ask for details on this new jack as well as on our 3, 5, 7, 12 and 20 ton models.

**HEIN-WERNER MOTOR PARTS CORP.**  
WAUKESHA, WISCONSIN

FEW MODELS ENGINEERED TO DO THE WORK OF MANY.  
**HEIN-WERNER**  
*hydraulic JACKS*



## Let Em Down Easy

(Continued from page 22)

Remove the end cap on the right first, allowing the arm to return slowly so that the piston and valve can be removed. Then remove the other end cap, valve and piston. Examine the holes in the top of the pistons to be sure that they are open and that the spring and valve are seating properly in the counterbores on the inside of the piston. While removing the parts, note their respective positions in the assembly so that they will be reinstalled properly.

Reassembly is done in the reverse order, being sure that the higher

pressure relief valve is placed in the rebound side of the unit. This is the side in which the adjusting screw is located. Install the end caps and fill the unit through the filler plug hole, working the arm up and down to force out all the air.

### Servicing the Monroe Direct-Acting Type

The direct-acting type of shock absorber, as used on the Hudson and Terraplane models, is quite different in construction from those previously described. It consists of two vertical cylinders, one operating within the other, a piston and rod, with relief holes located in the piston head. When the car springs are compressed, the

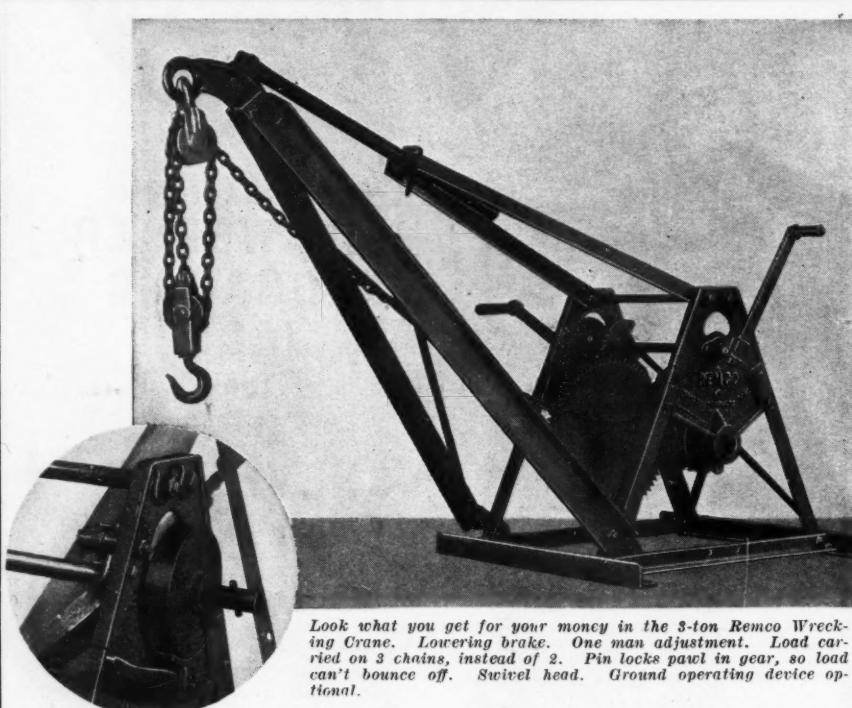
piston (6) moves toward the lower end of the cylinder. Oil beneath the piston is forced upward through the ball checks (7). When the car springs rebound, the piston moves toward the top of the cylinder and the oil now above the piston is forced downward through metered holes in the piston, forming the resistance to the movement of the car body.

To refill these units it is necessary to remove them from the car. Remove the drain plug from the bottom of the unit, and pump out all the old oil. Then place the lower end of the unit in a vise, with the filler hole upward. Fit a filler cup in the hole and fill the cup with the correct amount of fluid. Front shock absorbers require  $3\frac{1}{2}$  ounces, and rear shock absorbers require  $4\frac{1}{2}$  ounces. Then grasp the outer cylinder and pull, extending the shock absorber to its full limit. This will draw in the fluid in the filler cup.

When checking for noise, make sure that all brackets are bolted tightly to the frame and axle, and that the shock absorber is not interfering with other parts of the car. A new rubber bushing can be installed in the "eye" end of the unit by lining it up with the "eye" and pressing it into place with a vise.

The bushing (9) which forms the top of the inner cylinder, is screwed into the cylinder and is fitted with two holes (4) on the top. Should it become necessary to disassemble the shock absorber, place the lower end in a vise and compress the unit, turning the outer cylinder until the pin (3) fits into one of the holes (4). Then the bushing (9) may be screwed out of the cylinder, and the unit pulled apart. The piston rod nut (5), piston (6), washer (8), and balls (7) can then be removed from the rod. Reassembly is made in the reverse order, being sure that the bushing (9) is installed with the holes toward the top.

To increase the resistance developed by this type of unit, it is necessary to replace the piston with one having smaller holes through which the oil is metered. To decrease the resistance, replace the piston with one having larger holes.



Look what you get for your money in the 3-ton Remco Wrecking Crane. Lowering brake. One man adjustment. Load carried on 3 chains, instead of 2. Pin locks pawl in gear, so load can't bounce off. Swivel head. Ground operating device optional.

... and the price is only \$87.50

No use trying to estimate the money you've lost in the past few years by *not* having a wrecking crane. But it is time you did something to prevent *any* further waste of your own profits.

The Remco Wrecking Crane brings you every new invention for added power, speed and safety—at a price which is kind to your purse. For complete details, write! Manley Products Corporation, State and Hay Sts., York, Penna.



# REMCO

SHOP EQUIPMENT

HYDRAULIC PRESSES, CAR WASHERS,  
WRECKING CRANE, JACKS, TRESTLES, Etc.

R. E. Manley

### Major Bowes to Broadcast New Series for Chrysler

Major Bowes and his amateurs will go on the air for Chrysler about the end of August over the C.B.S. Details of the program are being worked out by Ruthrauff and Ryan, advertising agency.

### Roanoke Repairmen Hold Annual Meeting, June 25

Officers were elected at the annual meeting of the Roanoke (Va.) Automobile Service Assn of independent garagemen, June 25. Past President W. M. Shickle addressed the meeting. New officers are: Ernest S. Cochran, president; T. N. Gibson, vice president; Marvin E. Andrews, secretary, and Charles H. Miles, treasurer. The executive committee is composed of: W. M. Shickle, W. Clay Counts, J. W. Price and C. E. Trout, Jr. W. M. Green, George Finger and M. M. Early are serving on the Membership committee.

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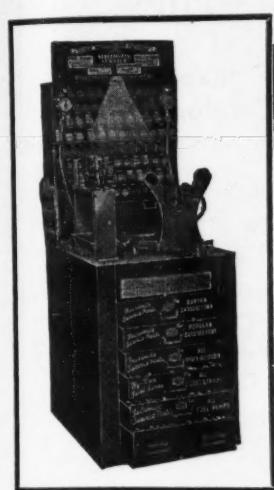
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## HYGRADE 5-POINT SERVICE UNIT



CONTAINS PARTS, TESTING APPARATUS AND TOOLS FOR SERVICING:  
CARBURETORS FUEL PUMPS  
SPEEDOMETERS (Tips, Shafting & Casing)  
FUEL LINES  
SHOCK ABSORBERS

SERVICE UNIT, A combination Parts Cabinet, Work Bench and Testing Bench, Value \$40.00.  
DEALER PRICE FOR PARTS, TESTING APPARATUS AND TOOLS, COMPLETE, \$190.

FREE



### Vacation Days Are GOLDEN DAYS With This Hook-up

AUTHORITIES on shop work estimate that about one-sixth of all repair jobs are on Carburetors and Fuel Pumps! Shops that are not prepared to handle this class of work are losing a lot of money!

Get started in these profitable branches of overhaul NOW, during the vacation months, when motorists tune up for long tours—and hard-driven cars develop weaknesses in vital auxiliary parts.

Hygrade's 5-Point Service Unit makes it easy for any shop to become a specialist in Carburetor and Fuel Pump reconditioning—and in addition opens the door to three other profitable specialized lines. Easy money without the backache and headache of the average repair job!

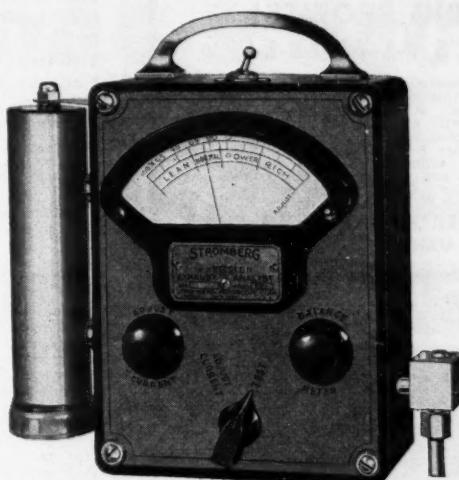
Get in line with other progressive shops that are cashing in big on this money-maker.

Write us for particulars if your jobber can't supply you, being sure to send his name.

HYGRADE  
PRODUCTS CO.  
516 West 34th St.  
New York, N. Y.

Hygrade  
AUTOMOTIVE  
PRODUCTS

## BOOST YOUR PROFITS EXHAUST ANALYST, MODEL EP-1, \$45



If you are interested in building up a bigger and better business through tune-ups, you will need the Exhaust Analyst. Take this easy way and sell more repair jobs, as you can give your customers the fuel economy that they want. You will find that this Analyzer cannot be beat for increasing sales, and it is simple to operate, as all indicating lag has been eliminated.

Write for the story of the part that the Exhaust Analyst played in the Indianapolis Race, and information on Stromberg instruments, and analyzers. There is also a cabinet type Exhaust Analyst at \$150.

STROMBERG MOTOSCOPE CORP.  
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# Quality ARMATURES COST NO MORE!

It doesn't pay to take a chance on unknown makes when you can get Quality AR-NU Armatures at no additional cost. Made entirely of NEW materials in a Plant devoted EXCLUSIVELY to the manufacture of Quality Armatures. The next time you need an Armature, ask for an AR-NU by NAME. They cost no more and you are absolutely sure of satisfactory service.



### SIZES MUST BE CORRECT

Worn condition of shaft and commutators causes play that is responsible for most Armature troubles. Save yourself trouble—satisfy your customers—give them AR-NU Armatures that are made to CORRECT SIZES.

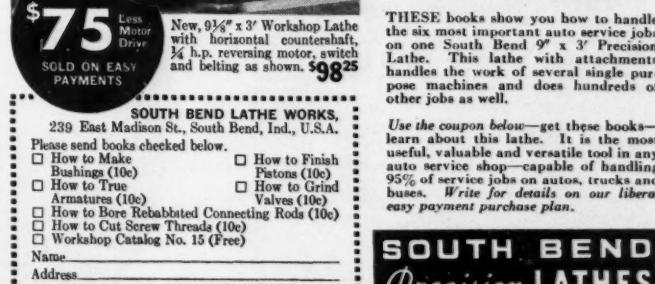
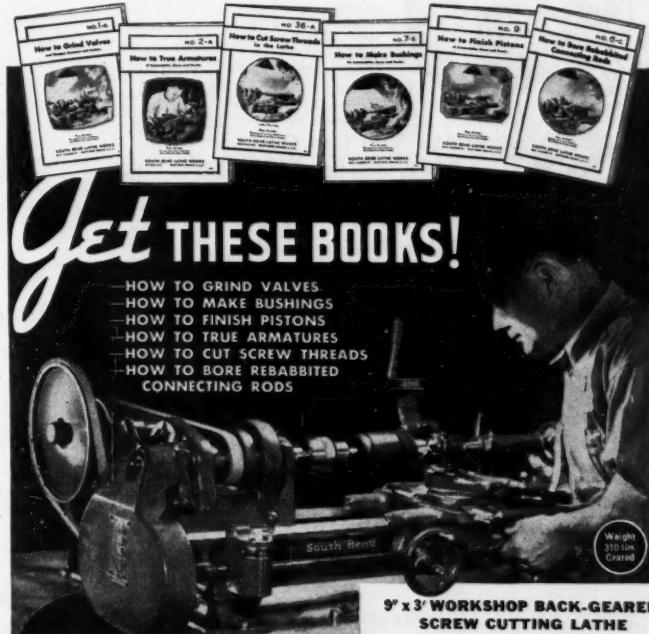
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**\$75** Less Motor Drive  
SOLD ON EASY PAYMENTS

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Please send books checked below.

How to Make Bushings (10c)  How to Finish Pistons (10c)  
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These books show you how to handle the six most important auto service jobs on one South Bend 9" x 3' Precision Lathe. This lathe with attachments handles the work of several single purpose machines and does hundreds of other jobs as well.

Use the coupon below—get these books—learn about this lathe. It is the most useful, valuable and versatile tool in any auto service shop—capable of handling 95% of service jobs on autos, trucks and buses. Write for details on our liberal easy payment purchase plan.

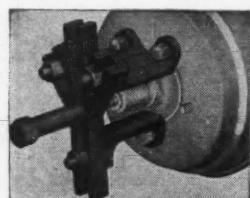
**SOUTH BEND**  
*Precision LATHES*

**HOOSIER  
BRAKE LINING  
FOR LOW COSTS AND  
BIG PROFITS!  
IT'S F-L-E-X-I-B-L-E!**

Go for Hoosier in a big way! It will repay you by saving time on relining jobs and boosting profits! It's flexible—bends like a belt! Hoosier will not glaze—it lasts longer and brings repeat orders from satisfied customers. Use Hoosier F-l-e-x-i-b-l-e Brake Lining on your next relining job. It'll repay you in low costs and big profits! Order from your jobber today! Or write direct to

**HOOSIER BRAKE LINING CORP.  
NORTH MANCHESTER INDIANA**

**PAYS for ITSELF**



**MANY TIMES  
YEARLY**

Don't waste valuable time removing frozen gears, wheels, etc. when \$7.50 spent for a Springfield Wheel Puller will pay for itself many times a year. Fits 98% of all 1929-1936 cars. SEE YOUR JOBBER OR WRITE DIRECT.

Delivered price: \$7.50

**Springfield Wheel Puller Co.  
510 Hubert St. Springfield, O.**

**Full Size Professional  
ARC Only  
WELDER \$29.50**



Amazing Machine, with Efficiency of Arc Welders Selling for \$145.00 to \$800.00. Offered at Breath-Taking Low Price.

**Now You Can Own  
Big, Full Size  
ELECTRIC  
ARC WELDER**

**For Auto And All Other Repair Work**

Here's thrilling news! A full size, heavy duty Aladdin Electric ARC WELDER—only \$29.50! Not a toy, but a big, 100-pound man-sized machine that does all types of welding uses all kinds of rods, welds all weldable metals and alloys with amazing efficiency, everything from motor blocks to fenders. A sturdy, welded-steel-construction machine, yet easily portable on casters.

**Works from 110-Volt Socket:** Simply plug into any light socket with 110. or 220 Volt AC current. Economical—costs only a few pennies an hour to use. Often pays for itself on first or second job. Can be carried right to outside jobs in auto, truck or side car. Has safety fuse. Crystalline Finish cabinet. Simple, complete instructions for doing all kinds welding jobs included.

**Amazing Details FREE!** Send no money! Write today for fascinating facts about this new Aladdin ARC WELDER at \$29.50! At last inventors, machine shops, garages, factories, etc., can obtain a highly efficient machine guaranteed to meet all claims, at a fraction of the price asked for others—at a saving that may amount to **several hundred dollars!** Send today for full details. You are not obligated.

**COMMONWEALTH MFG. CORP.  
3785 Beechmont Ave., Dept. J-68,  
Cincinnati, Ohio**

**MAIL THIS COUPON**

Commonwealth Mfg. Corp.  
3785 Beechmont Ave., Dept. J-68,  
Cincinnati, Ohio.

Please rush me at once full details regarding the Aladdin Electric Arc Welder.

Name \_\_\_\_\_

Address \_\_\_\_\_

Town \_\_\_\_\_ State \_\_\_\_\_

**Los Angeles Raceway**

(Continued from page 42)

vide 60 individual garages for the entrants similar to the exclusive garage paddock at Indianapolis, famous as an incubator of automotive ideas. For the first race, provisions will be made to comfortably handle 125,000 spectators, of which 50,000 will occupy the several grandstands along the homestretch and on the curves entering and leaving the home stretch. Parking space will be provided for 40,000 automobiles.

The managing director of the new speedway is Zack J. Farmer, who successfully managed the important Olympic games conducted in Los Angeles in 1932.

In addition to the automobile races, Los Angeles Raceway also is planned for other sports events including airplane features. Nothing definite has been announced along this line except that a huge runway will be provided in the infield.

With the addition of Los Angeles Raceway to the National Championship circuit and its \$60,000 prize slip, a part of this year's racing purse, the title campaign now has attained the not-recently-heard-of purse of more than \$200,000. The \$100,000 at Indianapolis and the \$60,000 at Roosevelt Raceway and the \$60,000 at Los Angeles Raceway, approximate this figure, which is the largest national championship purse in many years.

The new courses also present a new problem for leaders in the battle for the expensive diamond-studded gold medal which goes to the National Champion. For a time, because of his victory at Indianapolis and the 600 points that go with that win, Lou Meyer was conceded as the new king of the sport and thus the first man ever to hold the National Championship four times. However, the 480 points offered at Roosevelt Raceway and the 600 points awaiting the winner of the Los Angeles Raceway classic are enough to far surpass the points which Meyer now holds for his campaign so far this summer.

It is possible, too, that even one of the outstanding Europeans may hold the title, for both of the new and unique raceways are biddings for the appearance of Europe's headliners, and it is understood that many have already either signed entry or have voiced their intentions of competing in the United States this fall.

Like Roosevelt Raceway, it is planned to conduct two major events each year in Los Angeles. The first Sunday following Thanksgiving Day is to be the fall classic, and Washington's Birthday on February 22 is to open the racing season.

**Wagner Offers Cabinets  
Of Assorted Brake Parts**

Wagner Electric Corp., Automotive Parts Division, St. Louis, Mo., is offering 18 new assortments of Wagner-Lockheed Hydraulic parts. The repairman or dealer now has a choice of the new Wagner No. FL9B small general assortment, or one for a particular make of car or truck, or a wider range can be serviced from the stock included in assortments put up in 3, 4 and 12 drawer cabinets.



**Service Station  
and**

**GARAGE MEN !**

**Have you received  
YOUR COPY**

of

**the New "Every-Day"  
Catalog**

of

**Genuine  
SERVICE INDIANAPOLIS  
"Measurably Better"  
SPRINGS**

and **HELPER SPRINGS**

**ASK YOUR JOBBER**

**OR WRITE US TODAY FOR NEW  
FREE "EVERY-DAY" CATALOG**

*Manufactured only by*

**SERVICE SPRING CO.  
INDIANAPOLIS, IND.**

**STEEL CRAFT**

**PISTON  
RING**



Fits tapered and out-of-round cylinders without reborning. Restores compression, stops loss of oil and increases gasoline mileage.

*Write for  
Particulars*

**Steelcraft Piston Ring Sales, Inc.  
1017 Franklin Street, Detroit, Michigan**

**LINKERT**

**The  
WORLD'S OUTSTANDING  
CARBURETOR  
and**

**PERFECT PARTS**

*Replacement Line  
for All  
Popular Carburetors*

**LINKERT CARBURETOR CO.  
INDIANAPOLIS, INDIANA**

**SYNCHRONIZE**

**FORD V8's**

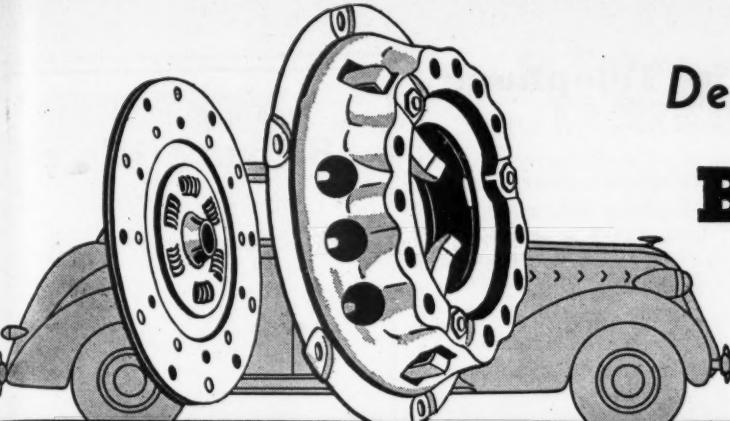
and all other systems on

**SHURHIT  
STROBOSCOPIC  
ANALYZER**

**Dealer Price  
\$125.00**

*ask for details*

**SHURHIT PRODUCTS, INC.  
Waukegan, Illinois**



Dependable Performance

## BORG & BECK CLUTCHES

Products of Experience

DIVISION OF BORG-WARNER CORPORATION

### FULTON DRIP MOULDING



New profit item now available to the trade. High quality, attractive drip moulding formed of polished, stainless steel. Rubber sealed, water-proof fit. Easily attached with self-tapping screws. Made in 3 lengths (30", 34", and 39") to fit various cars. Can be fitted by hand to conform exactly to door curvature. Meets definite need in a wide market.

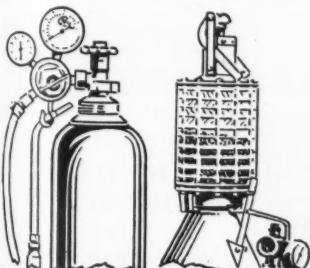
Price, per pair, \$1.75

The FULTON Co., 1912 S. 82nd Street, Milwaukee, Wis.

★ A complete line of replacement springs, helper springs, and spring parts for all popular makes of cars and trucks. Built right, engineered right, priced right.

Write for catalog, prices, and complete details—or See Your Jobber

**TRAINOR**  
NATIONAL SPRING COMPANY  
New Castle, Indiana



### A SIGHT FEED doesn't even LOOK like any other ACETYLENE GENERATOR!

Probably you already know you can save 2/3 or more of your acetylene cost by using a generator—BUT, did you know that SF Acetylene is purer, "hotter" and goes farther? . . . Did you know that SIGHT FEEDS are actually more portable and convenient than cylinders? . . . Did you know that only with a SIGHT FEED is it possible to tell exactly how much gas is available at all times?

Ask your jobber, or write

**THE SIGHT FEED GENERATOR CO., RICHMOND, IND.**

### Hook Up with "KING" MONEY MAKERS and PROSPER!!

READ WHAT JOHN MILLER  
OF TAUNTON, MASS. wrote



"We are having more new customers coming in for our "KING" Motor Tuner up than we have had since we have been in business. Please be advised that we have more than earned our investment in the "KING" Tester and also wish to advise that we have increased our business." John Miller, Auto Battery and Electric Service Company, 59 Broadway, Taunton, Mass.



"KING"  
MT-80  
\$85.00



"KING" WELDERS  
ARE REAL  
MONEY MAKERS



Ask Your Jobber or Write Us Jobber's Name  
21" x 18" x 34" high

**The ELECTRIC HEAT CONTROL Co.**  
9123 INMAN AVE., CLEVELAND, OHIO

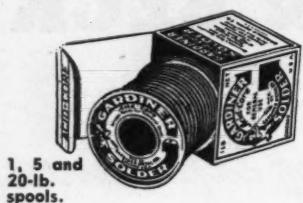
**KING** • Good Products Since 1914 • **KING**

#### ALL UNITS SOLD ON DEFERRED PAYMENTS

You can make REAL money with the "KING" ARC Welder because it is a quality unit that will do a first-class job in short order. It has seven important features, too many to describe here so be sure to get literature. The "KING" Indicating Selector Switch is something you ought to know about before buying ANY welder. Get the dope from your Jobber or write us. IT'S A REAL MONEY MAKER.



## SOLDERS BETTER • COSTS LESS •



Gardiner Acid-Core Solder is preferred by experts and amateurs alike because it makes better work easier to do—it speeds up the job and assures a nearer finish.

Because of its uniform high quality it goes farther and costs less than ordinary "nameless" solders.

Write for generous sample of Gardiner Acid-Core Solder—mention your jobber's name.

Gardiner also produces excellent grades of bar, body and solid wire solders, and babbitts.



4839 So. Campbell Ave., Chicago, Ill.

Radiator, battery repairing and all sorts of soldering jobs easily done with the

**TORIT**  
Acetylene Torch  
No. 23

Simply connect to  
Presto Tank. Includes  
a set of 4 tips. Price, \$6.75.

**TORIT MFG. CO.**  
290 Walnut St., St. Paul, Minn.



## Get Into Wheel Balancing!

### L & H Adjustable Balancing Weights



Easily adjustable without removing or deflating tire. Corrects shimmy, tramp and excessive tire wear. Never get loose on wheel. Easiest to install. Sold by leading jobbers. Investigate!

WRITE  
for  
CIRCULAR!

**HARLEY C. LONEY CO.**  
16517 Wisconsin, Detroit, Mich.

## B.B.B. CARBON PRODUCTS

BRUSHES      METAL GRAPHITE  
SHAPES      WELDING CARBON

The experience of 25 years of carbon engineering available on request.

**Becker Brothers Carbon Co.**  
223-25-27 N. Ashland Ave.  
CHICAGO, ILLINOIS

## — On the Telephone

(Continued from page 21)

connection with some matter, make your interview clean-cut, even to the point of first writing down the various points you wish to take up in the conversation.

Avoid any joking over the telephone with people you do not know. Don't try to be funny with anyone you are not acquainted with, as they may take it the wrong way.

And, this is important—when customers call in, don't keep them waiting. If the person they desire to talk with is busy, obtain the message and promise to deliver it immediately, or arrange to call back. And while the receiver is off, do not shout or clown, as your antics may convey the wrong picture. In fact, it is better to put your hand over the transmitter.

"When someone calls for a particular individual, don't reply and say, 'Mr. Smith isn't in yet,' say, 'Mr. Smith isn't here at the moment. Shall I call you when he comes?'

The automobile repairing business has outgrown the blacksmith atmosphere. It is a modern business service institution. The public doesn't want "rough stuff" over the telephone. Women are having as much to do with cars as men. It will pay you well to look into and improve your telephone service.

## Perfect Circle Employees Get Week's Paid Vacation

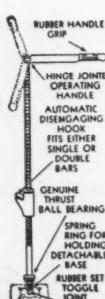
All employees in the Hagerstown, New Castle, Tipton, Ind., and Toronto, Canada, plants of the Perfect Circle Co. are to receive a week's vacation with pay, according to announcement by the management. The vacation period for the United States plants begins July 4 and the Canadian plant Aug. 1. This is the third successive year that Perfect Circle employees have been given a vacation without loss of pay.

## WOODWORTH

### BUMPER JACK

#### WORKS FAST AND EASY

Getting a wheel off the ground quickly without a lot of work is what the Woodworth does for you—and your customers. You make money both ways. Rubber-set foot adapts to uneven ground—won't slip. Ball thrust bearing makes it run easy. Use it or sell it, you make money. \$3.50 and \$4.50. Ask your jobber.



**WOODWORTH**  
SPECIALTIES CO.  
Binghamton, N. Y.

Be sure it's a

Genuine

**PUROLATOR**

**Sinko**  
LIGHTERS  
LAST

Attractive Metal Display available that serves as a Silent-Salesman. Beautifully finished in Crackle. Write for Catalog.

**SINKO TOOL & MFG. CO.**  
351-371 N. Crawford Ave., Chicago, Ill.

**FREE!**

New Hoof Governor Sales Manual, just off the press. 64 pages! Packed with facts, charts, graphs and statistics all arranged in easy, quick, ready reference form. An invaluable guide for any person who buys, sells or specifies governors for truck, passenger car, bus, tractor and industrial engines. The manual is free. Send for your copy at once.

**HOOF PRODUCTS CO.**  
162 No. Franklin St., Chicago, Ill.

**A-T-B**      **THRUST**  
**BEARINGS**



GIVE GENUINE SATISFACTION  
WITH PROFIT TO YOU

Ask Your Jobber

AUTOMOTIVE THRUST BEARING CORP.  
2021 So. Michigan Ave., Chicago, Ill.

Wiry Joe says— "Go after  
DOG DAY PROFITS  
with  
**CRESCEENT**  
**WIRING**"

Catalog FREE.  
Address Dept. F

**CRESCEENT CABLE COMPANY**  
PAWTUCKET, R.I., U.S.A.



### A NEW TESTER

Sold Under a New and Sensational Plan

See Your Jobber  
Features every necessary Test

Equipped with Telephone type jacks and plugs; Motorized Breaker; Precision Spark Gap; 0-600 and 0-30 Ammeter; Combination Vacuum and Fuel Pump tester; Combination Compression and Oil Pressure.

A new and sensational tester engineered correctly. Your jobber can deliver this tester to you under a surprisingly low price plan. See him at once.

Write for complete descriptive catalog page.

**BESCO PRODUCTS, Inc.**  
7524-30 Greenwood Ave., Chicago, Illinois.

Flexible fuel lines—Brass tube service parts—Dash controls—Hydraulic brake service parts—Hydrometers and Freezemeters

**Weatherhead**

THE WEATHERHEAD CO.  
620-714 Frankfort Ave., Cleveland, Ohio

**Quality GEARS**



• ALL GEARS NEATLY PACKAGED •

A Better Replacement Gear Service.

**NEW PROCESS GEAR CORPORATION**  
SYRACUSE, NEW YORK

**Ahlberg** GroundBearings

40%

Saving Over New Bearing Costs

**AHLBERG BEARING CO.**  
Chicago

Branches and Distributors  
Everywhere

**Ahlberg** GroundBearings

## It Takes Guts To Be Free

(Continued from page 29)

founded on freedom for the individual. Our national government was purposely made weak to protect the freedom of the individual. By just the extent that the powers of the national government are increased, to that same extent will the freedom of the individual be decreased. The more that we ask the government to do for us, the more shall we have to pay for the service through sacrifice of rights and privileges.

In this country we want neither economic royalists nor political royalists. What some, for political purposes, would have us believe that imaginary economic royalists are doing to us is as nothing when compared with what real political royalists would do to us even if they had only the best of intentions. We have fought in the past to get out of their clutches. We have fought for the right to carve out our own individual destinies just so far as that is humanly possible.

It takes guts to be free. Individual freedom means individual responsibility. We can't have both freedom and security. The jailbird has security. The more we call on the national government to do for us, the more closely will our condition approach that of the man in jail. We can't have any governmental regulation without some degree of regimentation. The more governmental regulation we have the more regimentation we shall get. Look again at Russia, at Germany and at Italy.

It takes guts to be free. It takes the highest type of courage—spiritual courage. It takes the kind of courage that fits a man to win the personal battles of every day life, to meet unfair competition, for example, with honest values and better service. It takes intelligence also. It takes tolerance and a recognition of and respect for the right of the other fellow to his freedom.

Our illustration this month shows the battle between the U.S.S. Constitution and the British ship Guerre. That battle was fought in the War of 1812 in which we defended our freedom as a nation. During that war Francis Scott Key wrote "The Star Spangled Banner." In the words of our national anthem we can ask ourselves today—

Oh, say does that star spangled banner yet wave  
O'er the land of the free and the home of the brave?

It takes guts to be free. If the Star Spangled Banner still waves o'er the home of the brave—and the wise—it will continue to fly o'er the land of the free.

### Bob Crosby On Ford Broadcasts

The Ford dealers of the United States inaugurated a new series of 13 quarter-hour radio programs commencing July 13. The transcribed programs, which are a continuation of the Ford V-8 Revue series, feature the music of Bob Crosby and his orchestra.

# Lubrofacts

FOR AUGUST  
By C. C. CURTIS,  
Lubrication Engineer  
HALSTEAD PRODUCTS COMPANY

## GUMS CAUSE POWER LOSS AND INACCURATE TUNE-UP INSPECTIONS

Fuels as well as oils form gums. Gum formations on valve stems, piston rings and bearings not only cause loss of power but erratic and poor motor performance. Sticky piston rings allow blow-by at higher speeds, resulting in waste of fuel and excessive oil consumption. Gummy valves cause loss of compression, hard starting, improper carburetor adjustment, loss of power and fuel. Consequently no Motor TUNE-UP Inspection is accurate unless these conditions are first corrected. Use Halstead TUNE-UP Oil, gum and carbon solvent.

## CORRECT TUNE-UP PROCEDURE

Prior to each TUNE-UP Inspection, TUNE-UP Oil is introduced into the intake manifold, while the motor idles. It may also be added to the gasoline (1/2 pint to 10 gallons of gasoline). The quick corrective action of a Halstead TUNE-UP is immediately noticed. Compression levels out, and maximum pick-up and power are developed. Sluggish motors respond almost instantly to this treatment. The improvement lasts from 1500 to 2000 miles.

## TUNE-UP BUILDS BUSINESS

Motorists realize the importance of changing crankcase oil every 1000 or 2000 miles. Likewise they are beginning to appreciate the importance of periodic motor inspections. A motor TUNE-UP Inspection every 5000 miles results in safer and better motor performance. To Service Managers it means the increased sale of replacements, such as spark plugs, gaskets, wiring, etc., besides "major" and "minor" overhauls. Concentrate on Motor TUNE-UP and Motor Check-Up. Include one pint of Halstead TUNE-UP Oil with each Check-Up.

## USED CAR DEALERS AND FLEETS EFFECT SAVINGS UNDER NEW PLAN

Used Car Dealers are realizing greater savings in repowering their used cars with use of Halstead TUNE-UP Oil. Large fleet owners, likewise, are effecting more economical maintenance and performance by using a pint of Halstead TUNE-UP Oil every 2000 miles, in every unit.

## SALES AND SERVICE HELPS FOR DEALERS

Counter and Wall TUNE-UP SERVICE RACKS are free to all large users of Halstead. Three-color wall placards outlining Halstead's 14 Point Motor TUNE-UP Program may be had. (Simply send us the name of your jobber.) It means money to you to offer Halstead TUNE-UP Service. HALSTEAD PRODUCTS COMPANY, Makers of Famous SPRINGEEZ, 2937 Chapman St., OAKLAND, Calif.

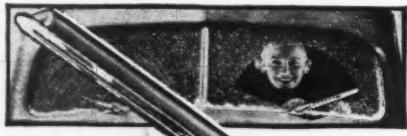


**W**eighting  
less than 4 cigarettes,  
the Thexton Expander  
preserves the delicate  
factory balance that is  
essential for perfect  
motor performance.

## THEXTON PISTON SKIRT EXPANDERS

THEXTON MANUFACTURING CO., Inc.

Minneapolis, Minnesota  
Canadian Branch • Chatham, Ontario



**FITS  
ALL CARS  
40c**  
**SLEETEX**  
WINDSHIELD DEFROSTER BLADE

**MEN!** You Can't Go  
Wrong on the  
A & C Coil Tester  
at **\$1.25**



BUILT RIGHT  
WORKS RIGHT  
PRICED RIGHT

A & C Manufacturing Co.  
1613 N. 18th Street, Philadelphia, Pennsylvania

### SCOTT COMPRESSORS MAKE SUPER - SERVICE STATIONS



**SCOTT AIR COMPRESSOR CO.**  
Manufacturers

4674-82 Mulberry St., Philadelphia, Pa.

Why limit profits and services with an ordinary pump when SCOTT Compressors will do twenty-five profitable and customer-attracting jobs? Known for quality and special features but low in price. See your jobber or write direct for free illustrated catalog and prices.

### "Before" and "After"

(Continued from page 26)

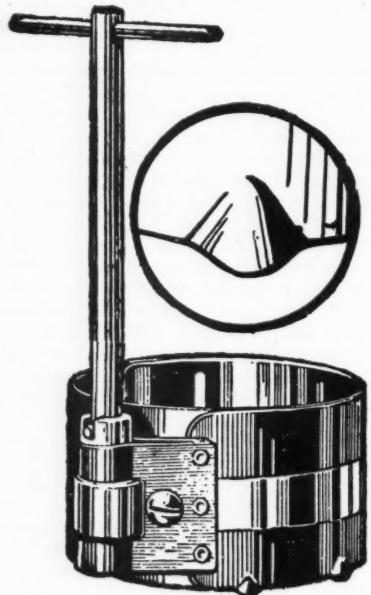
it, and put in some new modern equipment.

On the top of the page, you see the junk-strewn side room before Gomola and Berner got the idea of making it pay its share of overhead and profit. Immediately above, is an "after" picture taken in the same spot a month or two later.

On the right is Jacob Berner and Michael Gomola, maintenance partners, and their new pick-up and delivery truck, which they bought to round out their new selling campaign.

### Design Changed On Piston Ring Compressor

The National Machine & Tool Co., Jackson, Mich., announces a change in the design of their No. 419 Piston Ring Compressor. To replace the slight flare at the edge of the compressor band, a series of notches or beads is now employed. These beads are said to prevent the rings from slipping into the flare before entering the cylinder, and makes easier the installation of the multiple slotted or sectional type piston rings.



### Kreger Presents Drag Link Take-Up Springs For Fords

Drag link take-up springs for 1935 and 1936 Ford V-8 models have been



announced by The L. F. Kreger Mfg. Co., Chicago, Ill. Packed in sets of 4 to a carton, these springs are designed to give extra tension to eliminate rattles.

### Flint Loss-Proof Compression SPARK PLUG.

The favorite replacement plug with leading garage and service stations because it produces maximum power not only in the older type of motors but also in the latest type of high-speed, high compression motors.

Order from your jobber!

Write for literature!

C. V. S. Manufacturing Co.  
Flint, Michigan

### FREE AN ACCURATE TESTER

to every dealer who takes delivery of 24 gallons (or more) of

### EVEREADY PRESTONE

BEFORE OCTOBER 15, 1936  
—CALL YOUR JOBBER

### TIRE GROOVING is PROFITABLE!

And the world's finest equipment for doing it is made by KWICK-KUT!

Both PUSH type and PULL type grooving tools for either PATTERN blades or RIBBON blades.

The most complete line made, fully patented. Used by world's largest tire factories. Prices start at \$6.50. Ask your jobber or write!

Kwick-Kut Mfg. Co., Inc. 3854 Arsenal St. ST. LOUIS, MO.

### New High-Speed DREDNAUT BUMPERJACK \$2<sup>85</sup> LIST

FASTER and EASIER to operate — more positive action — thoroughly adaptable to all overhanging "fronts" and "rears" of new cars. Simply lift sliding rest to bumper bar and pump the handle.



AUTO SPECIALTIES  
MFG. COMPANY  
ST. JOSEPH, MICHIGAN



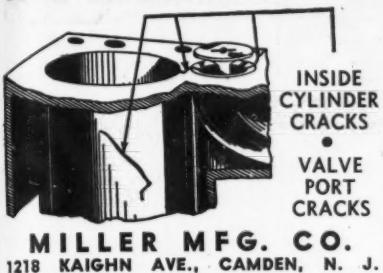
### MANLEY GARAGE EQUIPMENT

Manley Manufacturing Division  
of the American Chain Co., Inc.

York, Pennsylvania

IN BUSINESS FOR YOUR SAFETY

**30-MINUTE MEN GET THE JOBS—THEY STICK WITH WONDERWELD**



**30 Days to Prove it Pays**  
"Simplified" ARC WELDING

Garages and repair shops the country over are earning from \$150 to \$300 extra profit each month by doing simple 110-volt arc welding. Body and fender repairs, cracked motor blocks, frame repairs and hundreds of odd jobs are easily and profitably handled. Simplified control requires no unusual experience. Easy Pay-Off-of Profit Terms. Write for details.

HOBART BROTHERS CO.  
Box TA 86 Troy, Ohio

**HOBART**  
THE FASTEST SELLING WELDER  
ON THE MARKET TODAY

**GENUINE**  
**B-N PISTON PINS**

The acknowledged Standard of Quality for over 20 years.

ASK YOUR PARTS JOBBER

**BURGESS NORTON MFG. CO.**  
GENEVA, ILL.

**A NEW LOW PRICED**

**STEER - O - MASTER**

A complete front end and wheel alignment service unit, all analytical and corrective equipment included, at a price that makes this type of service more profitable than ever. Write for details.

**RIESS MANUFACTURING CO.**  
Kokomo, Indiana

**GENUINE NIEHOFF PRODUCTS**

*Approved Quality*

**IGNITION PARTS**  
**COILS AND CONDENSERS**  
**TESTING EQUIPMENT**  
**CUTOFFS-BRUSHES**  
DISTRIBUTED BY LEADING JOBBERS

**C.E.NIEHOFF & CO.**  
230 W. SUPERIOR ST., CHICAGO, ILL.

**St. Louis Spring Co.**  
Acquires New Plant

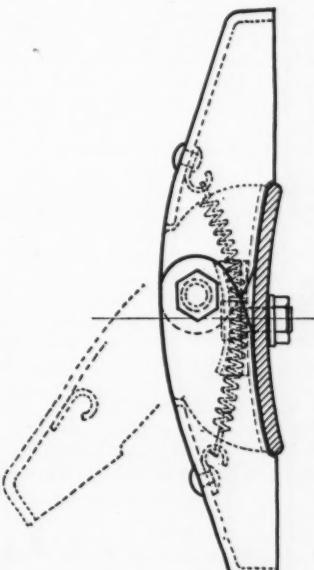
The St. Louis Spring Company, St. Louis, Mo., manufacturers of Moog-St. Louis replacement springs for automobiles, trucks, busses and trailers, and a complete line of replacement piston rings, has just purchased a modern plant on the western outskirts of St. Louis to take care of its rapidly expanding business. The new plant is located on three and a half acres of ground on U. S. Highway No. 40, and with direct switching service obtainable through the Terminal Railroad Association tracks on the grounds to all railroads entering the city, both East and West of the Mississippi River.

With factory floor space of approximately 70,000 square feet on the ground floor, ample space is provided for continuous one-level production. These factory buildings will be equipped with the latest manufacturing machinery and electric heat treating furnaces, and it is said this will be the largest spring replacement plant in the world.

The St. Louis Spring Company was founded about 20 years ago by the present owners and has grown rapidly to a place of leadership in the spring business. In addition to its modern plants in St. Louis, this Company has complete branch factories in Brooklyn, Memphis, Denver, Omaha, San Antonio and Oklahoma City, with branch warehouses in other principal cities.

**Cant-Hook Bumper Guard**

A new mounting for bumper guards that will permit either the top or the bottom of the guard to swing outward to release bumpers of other cars that have become hooked in back of the bumper guard has been announced by



G-R Products, 6949 Wolfram St., Chicago, Ill. It is claimed that the CANT-HOOK bumper guard serves the same purpose as the rigid type, while the special mounting provides the tilting feature, a heavy spring returning the guard to an upright position against the bumper bar.

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Every Model A - AA Ford

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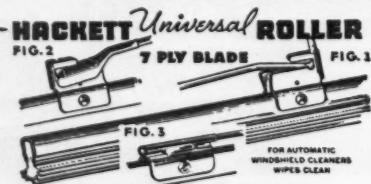
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## What Causes Scuffing?

(Continued from page 28)

under these conditions, the result is usually a completely scuffed cylinder, piston and ring assembly. The rings passing over the hot area scuff and carry destruction to the rest of the cylinder which in turn scuffs the piston.

If operation under these conditions is of shorter duration, the scuffed surfaces may smooth up under less strenuous operating conditions. The operation of some engines is a constant process of scuffing and smoothing up accompanied by high oil consumption and blow-by and excessive wear."

In one engine tested, a temperature of 540 deg. was measured at one point on the valve side of the wall while directly opposite the wall temperature was 290 deg. The hot spot in this case was 140 deg. above the safe limit set by Mr. Teeter for lubrication and the difference of 250 deg. between opposite sides of the cylinder undoubtedly resulted in considerable distortion. In another cylinder of this same engine, the temperature of a hot spot was found to be 460 deg. Only 5/32 in. lower down on the wall the temperature was 60 deg. lower, indicating the localized nature of the area of high temperature.

Incidentally, Mr. Teeter also presented evidence that under the conditions being discussed here, piston ring temperatures of the order of a 1000 deg. may be attained which is far above any measurements of wall temperatures given in his paper.

In the case of engines which scuff pistons, rings and walls because of local hot spots, the temperature reached by these hot spots can be held down to some extent by maintaining the cooling system free of scale so that it will function as efficiently as the design of the engine permits.

Scale consisting largely of mineral matter in the cooling water deposits at an accelerated rate on the water jacket side of these local hot-spots due to their higher temperature, according to discussion at the SAE meeting. This scale further reduces cooling efficiency thus operating to raise the temperature of the hot spots and causing them to reach dangerous temperatures under less severe operating conditions than they would otherwise. However, there are a number of materials on the market for use in the cooling water which will inhibit the formation of this scale and thus maintain as efficient cooling as the engine design will allow. The use of such materials will be especially helpful in hard-water areas.

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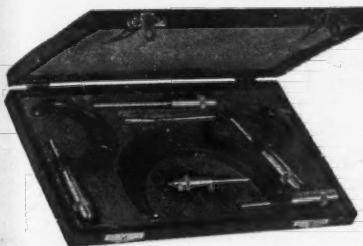
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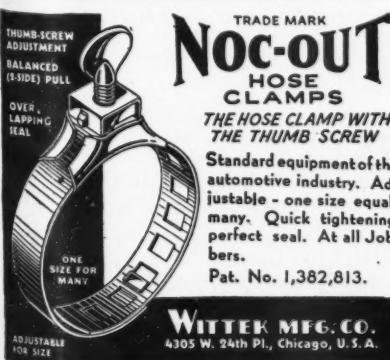
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MOTOR AGE, August, 1936

## Curtiss Hydraulic Brake Wheel Cylinder Clamp



An essential tool to hold the brake wheel cylinder pistons in place and thus eliminate the necessity of bleeding brake lines when brake shoes are removed has been announced by Curtiss & Smith

Mfg. Corp., Pottstown, Pa. It is made of heavy wire, and snaps over the ends of the cylinder.

## AC Entertains Model Plane Enthusiasts

More than 400 entrants in the National Model Airplane Meet, which was held this year in Detroit, were guests of the AC Spark Plug division of General Motors at a banquet which marked the close of the event, in Masonic Temple, Detroit.

Wilson S. Isherwood, general sales manager of the AC company, declared that "the young men who make model planes are representative of the very best of our next generation. It is to them that we will look for future progress in plane designing and in aviation."

Hector Rabezzana, chief engineer of the spark plug division of AC, served as technical engineering adviser for the contestants who entered gasoline-powered model planes. A tiny spark plug, specially made, was used in the midget engines.

Entrants from United States, Canada, France and New Zealand participated in the contest, which lasted three days at Wayne County Airport under the sanction of the National Aeronautic Association.

## Raybestos Heavy Duty Line Complete

The new Raybestos Heavy Duty line of products has simplified the determination of commercial vehicle requirements, according to a recent dispatch from the Raybestos Division of Raybestos-Manhattan, Inc., Bridgeport, Conn. The PG (proving ground) idea has been carried out in the truck field as far as the popular truck sizes are concerned and the balance of the field can easily be serviced with woven or molded sheet stock and brake blocks.

Raybestos brake blocks are available for the more popular trucks and buses, but service men doing truck work can have a stock of rigid molded and A & I woven sheet stock together with a jig saw to service that odd size or unusual job.

## Zecol Has New Scum Remover

Zecol, Inc., Milwaukee, Wis., has announced a new product, H. D. Scum Remover. It is claimed that this new product cleans and polishes in one operation, removing heavy road film and oxidation from automobiles. The manufacturer claims that it does not contain harmful abrasives or acid, and is not injurious to lacquers or enamels.

## MARVEL MYSTERY OIL

FOR

### MOTOR TUNE UP

Frees sticky valves and rings. Produces a more permanent job. Continues to work while motor is driven.

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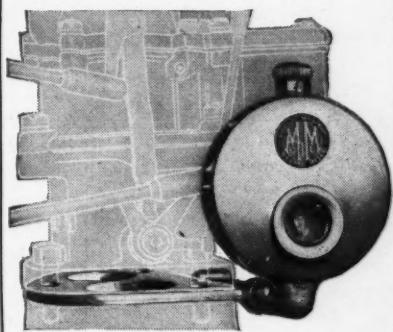
20% added to SAE 30 Crank Case Oil affords protection against seizure dangers and too rapid wear.

### NON- CORROSIVE

to any metals and is used in motors with copper, tin, lead and cadmium-silver bearings.

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carries Timken load of 25,000 lbs. per square inch.



## MARVEL MYSTERY

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### Automatic Feed

to power, load and speed requirements.

### ALL TYPES FOR

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<b>A</b>	
A & C Mfg. Co.....	82
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Ahlberg Bearing Company.....	81
Allied Manufacturers, Inc.....	84
Armature Co., The .....	77
Armstrong-Victor .....	74
Atlas Press Co.....	15
Auto Specialties Mfg. Co.....	82
Automotive Thrust Bearing Corp. ....	80
<b>B</b>	
Baldor Electric Co. ....	84
Becker Bros. Carbon Company.....	80
Bendix Products Corporation (Subsidiary of Bendix Aviation Corp.) .....	53-75
Besco Products, Inc. ....	81
Blackhawk Mfg. Co. ....	59
Borg & Beck Div. of Borg-Warner Corp. ....	79
Buell Manufacturing Company .....	85
Burgess-Norton Mfg. Co. ....	83
<b>C</b>	
C. V. S. Mfg. Co. ....	82
Carborundum Co. ....	71
Chevrolet Motor Co. ....	69
Chilton Co. ....	76
Commonwealth Mfg. Co. ....	78
Crescent Cable Co. ....	80
Curtiss & Smith Mfg. Corp. ....	84
<b>D</b>	
duPont de Nemours, E. I., & Co., Inc. ....	12
<b>E</b>	
Eclipse Machine Co. (Subsidiary of Bendix Corp.) .....	88
Electric Auto-Lite Co. ....	60
Electric Heat Control Co. ....	79
Electric Storage Battery Company .....	50-51
Emerol Manufacturing Co., Inc. ....	85
Ethyl Gasoline Corp. ....	67
Exide Batteries .....	50-51
<b>F</b>	
Ford Motor Co. ....	2
Fostoria Pressed Steel Corp. ....	72
Fulton Company .....	79
<b>G</b>	
Gardiner Metal Company .....	80
Gulf Refining Company .....	55
<b>H</b>	
Hackett Automotive Accessories Corp. ....	84
Halstead Products Co. ....	81
Hein-Werner Motor Parts Corp. ....	65
Hobart Brothers .....	83
Hoof Products Co. ....	80
Hoosier Brake Lining Corp. ....	78
Hygrade Products Co. ....	77

<b>I</b>	
Imperial Brass Manufacturing Co. ....	15
<b>J</b>	
Jaxon Co. ....	84
<b>K</b>	
Kathanode Corp., The .....	7
Keasbey & Mattison Co. ....	16

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(Figures Based on)

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Kreger Mfg. Co., L. F. ....	83
Kwick-Kut Mfg. Co., Inc. ....	82

<b>L</b>	
Lantz-Phelps Corp. ....	85
Linkert Carburetor Co. ....	78
Loney Co., Harley C. ....	80

<b>M</b>	
McCord Radiator & Mfg. Co. ....	3
Manley Mfg. (Div. of American Chain Co., Inc.) .....	82
Manley Products Corp. ....	66
Micro Products Co. ....	85
Miller Mfg. Co. ....	83
Motor Improvements, Inc. ....	80